

**Asarco East Helena Smelter
2007 Interim Measures
Work Plan Addendum**

**Speiss-Dross and Thaw House
Areas
Cleaning, Demolition and
Soil Sampling Work Plan**

**Prepared by:
ASARCO LLC**

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**ASARCO EAST HELENA SMELTER
2007 INTERIM MEASURES WORK PLAN ADDENDUM**

**SPEISS-DROSS AND THAWHOUSE AREAS
CLEANING, DEMOLITION, AND SOIL SAMPLING,
WORK PLAN**

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ASARCO EAST HELENA SMELTER
2007 INTERIM MEASURES WORK PLAN ADDENDUM

SPEISS-DROSS AND THAWHOUSE AREAS
CLEANING, DEMOLITION, AND SOIL SAMPLING, WORK PLAN

1.0 INTRODUCTION

On May 5, 1998, ASARCO LLC (Asarco) and the United States Environmental Protection Agency (EPA) entered into a Consent Decree (RCRA Consent Decree, U.S. District Court, 1998) to initiate the corrective action process in accordance with the Resource Conservation and Recovery Act (RCRA) and the Clean Water Act (CWA). As part of the RCRA Consent Decree, Asarco prepared several site investigation documents including:

- RCRA Current Conditions/Release Assessment (CC/RA) (Hydrometrics 1999a);
- Interim Measures Work Plan, East Helena Facility (Hydrometrics, 1999b);
- RCRA Facility Investigation (RFI) Work Plan (Hydrometrics, 2000); and
- Phase I RCRA Facility Investigation Report (Asarco Consulting Inc. (ACI) 2003, revised 2005).

A complete listing of RCRA Consent Decree documents is contained in the Phase I RCRA Facility Investigation (RFI) report.

As part of the RCRA Consent Decree, several interim measures were implemented for groundwater between 1999 and 2001. These earlier interim measures (IM) performed as part of the RCRA Consent Decree are discussed in Section 1.3 of the Phase I RFI report.

In May 2002, a RCRA Interim Measures Work Plan Addendum (IMWPA) was prepared (Hydrometrics, 2002). The 2002 IMWPA addressed groundwater impact concerns in the

intermediate aquifer within the City of East Helena and down-gradient residential groundwater supplies north of the Asarco Plant site. These interim measures are discussed in Section 1.2.1.3 of the IMWPA.

During April 25-26, 2006, Asarco, EPA, and the Montana Department of Environmental Quality (MDEQ), met at EPA offices in Denver in a working session to evaluate existing site conditions and outline a strategy for groundwater remedial measures at the site. MDEQ's participation addressed the need for coordination of plant facility cleanup activities associated with a Montana Consent Decree (CDV-2004-212) with Asarco (see Section 1.2).

1.1 PROPOSED INTERIM CORRECTIVE MEASURES FOR GROUNDWATER

EPA has expressed its preference for passive corrective measures for source control and off-site migration of groundwater at the East Helena site. These measures could include in situ containment such as slurry walls and capping, or in situ treatment options such as soil fixation or permeable barrier walls. As a result of discussions between EPA, Asarco and MDEQ, groundwater corrective actions will focus on three general areas:

1. The former acid plant sediment drying area;
2. The speiss/dross area; and
3. The elevated groundwater arsenic plume down-gradient from these areas.

As a result of the April 2006 meetings between Asarco, EPA and MDEQ, and the follow-up of several action items as a result of the meetings (including preparation of cost estimates by engineers and contractors), the general strategy for groundwater corrective actions at the East Helena Facility is as follows:

- Slurry wall construction and temporary capping of the former acid plant sediment drying area. This project was completed in the Fall 2007. The trace of this slurry wall is shown on Figure 1-1.
- Slurry wall construction and capping of the speiss/dross area.
- Construction of a PRB near the area of the present PRB test wall.

The Groundwater Corrective Action Plan - 2006 (Asarco, August 2006a) presented the conceptual design for implementation of these actions.

1.1.1 2006 Groundwater Remedial Actions

In 2006, groundwater remedial actions were focused on construction of a slurry wall and placement of a temporary cover in the former acid plant sediment drying area. As part of implementation of this project, several work plans have been prepared that address construction of a slurry wall and temporary cover in the former acid plant area including:

- 2006 Phase 1, Phase 2 and Phase 3, Final Cleaning, Soil Sampling Backfilling and Interim Cap Work Plan (Asarco, 2006b). (This document addresses the temporary cover design that was placed in the former acid plant sediment drying area);
- Design Basis Memorandum, Asarco Former Acid Plant Sediment Drying Area Slurry Wall, East Helena, Montana (Shaw E&I 2006a);
- Work Plan, Former Acid Plant Sediment Drying Area Slurry Wall, October 4, 2006 (Shaw E&I 2006b);
- Construction Quality Control Plan, Former Acid Plant Sediment Drying Area Slurry Wall (Shaw E&I 2006c);
- Site Specific Health and Safety Plan for Slurry Wall Construction at the Former Sediment Drying Area (Shaw E&I 2006d);
- Permeability Testing for Slurry Cutoff Wall Memorandum, (Shaw E&I 2006e);
- Permeability Testing for Slurry Wall Cutoff Wall, Asarco East Helena, Montana, October 9, 2006 (GeoSolutions Inc., 2006); and
- Addendum To Interim Measures Work Plan, East Helena Facility, Former Acid Plant Sediment Drying Area Slurry Wall, Monitoring, Operation, and Maintenance Work Plan, (Asarco, 2007a).

The design for the slurry wall around the former acid plant sediment drying area included the following features:

- The wall is 800 feet long, 33 feet deep and 3 feet wide;
- The wall was keyed a minimum of 2 feet into the underlying low permeability ash unit;
- The wall was constructed using the same excavation equipment used for the test PRB; and
- Standard bentonite grout was used for slurry wall construction.

The slurry wall around the former acid plant sediment drying area was constructed during late fall, October and November 2006. A Construction Completion Report documents construction and results of quality control testing (Shaw E&I, 2007a). A Soil-Bentonite Permeability and Compatibility Testing Report documents the performance of the bentonite slurry used for construction of the slurry wall (Geo-Solutions Inc., 2007).

1.1.2 2007 Groundwater Remedial Actions

In 2007, groundwater remedial actions will focus on construction of a slurry wall and placement of a temporary cover around the former speiss/dross area. A Design Plan for the Former Speiss-Dross Plant Area Slurry wall was prepared to address design and construction of a slurry wall and temporary cover (Shaw E&I, 2007b). The design for the former speiss dross area slurry wall includes the following features:

- The wall will be approximately 1,350 feet long, 35 to 42 feet deep and 3 feet thick;
- The wall will be keyed a minimum of 2 feet into the underlying low permeability ash unit;
- The wall will be constructed using the same type of equipment used for construction of the former acid plant area slurry wall; and
- Standard bentonite grout will be used for slurry wall construction.

The trace of the proposed 2007 speiss/dross area slurry wall is shown in Figure 1-1. In order to provide working access for slurry wall construction equipment, some of the speiss/dross buildings were demolished in 2006. However, several structures remain and will be demolished in 2007 to provide the working room access needed to construct the slurry wall. Figure 1-2 shows these structures including:

- Contractor's lunchroom and changehouse;
- Highline railroad;
- Speiss/dross plant baghouse and 200 foot stack;
- Charge Building;
- Blast furnace building remainder;
- Main office;
- Main natural gas valve house; and
- Garage.

As described in Section 1.0 above, the construction of the speiss-dross slurry wall needs to be sequenced and coordinated with those activities associated with the Montana Administrative Order on Consent, which include cleaning and demolition activities. Section 1.2 describes the Montana Administrative Order on Consent cleaning and demolition program for 2007.

1.2 MONTANA CONSENT DECREE CLEANING AND DEMOLITION PROGRAM FOR CALENDAR YEAR 2006

On February 15, 2005, Asarco and MDEQ entered into a Montana Consent Decree to resolve alleged violations of the Montana Hazardous Waste Act and Montana Administrative Code. Section IV of the Montana Consent Decree requires Asarco to develop and implement a yearly Work Plan designed to remove, store, and properly dispose or recycle all remaining hazardous waste and recyclable materials from identified process units located within the East Helena Plant.

1.2.1 Work Completed in 2006

Under the Montana Consent Decree, Asarco prioritized the cleaning and demolition of the process units located in the sinter plant during calendar year 2006. The scope of this cleaning and demolition project was referred to as Phase 1. In February and March 2006, Asarco submitted a draft and revised 2006 Work Plan for this project. The Department approved the Work Plan on March 17, 2006.

On July 14, 2006, Asarco submitted a revised 2006 Work Plan. This Work Plan expanded the cleaning and demolition of the process units within the East Helena Plant to include Phase 1, 2 and 3 sites. The submittal described the cleaning and demolition of the following areas.

- PHASE I - Sinter plant conveyor gallery, sinter building, sinter crushing circuit, sinter returns tower, agglomerator building, coke hopper, sinter hopper, and ventilation ducting.
- PHASE II - Laboratory, dross building, bullion casting, speiss granulating pit, speiss loadout, blast furnace flue (from the dross building to the No. 1 blast furnace), and north end of blast furnace building. (The sequence and timing of the cleaning and demolition of this facility was advanced to the 2006 program to help facilitate the anticipated construction of a speiss/dross area slurry wall in 2007.)
- PHASE III - Sinter plant baghouse, hot Cottrell, acid plant scrubbers, and mist precipitator building.

The cleaning and demolition activities outlined in the 2006 Work Plan were completed before December 31, 2006.

1.2.2 Montana Administrative Order on Consent, Proposed 2007 Cleaning and Demolition Work

The proposed Phase IV 2007 cleaning and demolition work was detailed in a "Bid Solicitation and Construction Documents for 2007 Cleaning & Demolition Project and CAMU – Phase 2 Cell Project" (Hydrometrics, January 2007). In response to bid submittals for the Phase IV project, Asarco selected URS/Cleveland Wrecking Company (URS/CWC) as the contractor for the 2007 Phase IV cleaning and demolition work at the East Helena facility. On May 18, 2007, Asarco submitted to MDEQ the 2007 Cleaning and Demolition Project (Work Plan). On June 13, 2007, MDEQ tentatively approved the Work Plan. Asarco has anticipated beginning construction of the Corrective Action Management Unit (CAMU) Phase 2 Cell in the spring of 2007. However, approval of the CAMU Phase 2 Cell was not obtained from EPA early enough to complete the entirety of the scheduled cleaning and demolition work as presented in the URS/CWC Work Plan. In an August 13, 2007 letter to MDEQ, Asarco described the cleaning and demolition work that will be performed in 2007. The areas scheduled for cleaning and demolition are shown on Figures 1-2 and 1-3. As described in Section 1.1.2 and shown in Figure 1-2, structures that require demolition to accommodate equipment access for construction of the slurry wall are shown in the following table:

Phase IV, Stage 1

- | | |
|--|--------------------------------|
| • Contractor's Lunchroom | • Contractor's Change Room |
| • Highline Railroad | • Main Office |
| • Garage | • Main Natural Gas Valve House |
| • Speiss/Dross Plant Baghouse & 200' Stack | • Charge Building |
| • Blast Furnace Bldg. Remainder | • Thawhouse |

1.3 2007 SPEISS-DROSS AND THAWHOUSE AREAS CLEANING, DEMOLITION AND SOIL SAMPLING WORK PLAN - SCOPE AND OBJECTIVES

As described in Section 1.2.2 above, a cleaning and demolition work plan that addresses the 2007 actions has been prepared and tentatively approved by MDEQ. EPA has requested the submittal of a specific work plan for the cleaning, demolition, and soil

sampling program for unpaved soil areas within the areas scheduled for cleaning and demolished in 2007.

The objectives of this 2007 IM Work Plan Addendum for the cleaning, demolition and soil sampling are:

- Describe any pre-demolition cleaning activities to be conducted in 2007.
- Discuss existing soil data obtained from sample sites adjacent to structures in the Speiss Dross and the Thawhouse areas.
- Outline general demolition procedures and associated building demolition.
- Describe the final cleaning actions designed to attain the objectives of the Montana Administrative Order on Consent.
- Outline the soil sampling and excavation protocols and procedures for assessment of exposed soil areas in unpaved portions within the demolished areas.
- Outline the areas in which backfilling using fumed slag will be required to achieve proper site stabilization and drainage,
- Present the locations that will require interim capping,
- Provide the interim capping techniques, procedures, and materials that will be used to inhibit infiltration of precipitation within the demolition areas, and
- Outline the general, short-term operation and maintenance for the interim cap.

2.0 2007 SPEISS-DROSS AND THAWHOUSE AREA CLEANING AND DEMOLITION WORK

2.1 2007 PRE-DEMOLITION CLEANING ACTIVITIES

Pre-Demolition cleaning activities include the following general steps (URS April 2007):

- Work area preparation;
- Initial dry removal of bulk solids; and
- Wetting of structure interiors for dust control.

Work area preparation consists of delineating a work area that can be both easily contained and is considered a cohesive area unit with like contamination. The former speiss-dross area and its associated baghouse has been delineated as a work area. Once the work area is defined, the contractor will remove any remaining accessible bulk solids that remain within the structures. The goal of this task will be to remove any remaining gross, dry accumulation of lead, lead dust, lead debris or other associated residues at all accessible areas. This will be accomplished using hand tools and a trailer mounted "Hurricane" vacuum system with HEPA filtration. The remove material will be loaded via air-tight chute into appropriate containers (i.e., double 6-mil mega bags, etc.) and staged for temporary placement in the Coverall buildings or the concentrate storage and handling building. The material will be transported at a later date for eventual placement in the CAMU Phase 2 Cell. This initial removal of solids at ground level will ensure a more effective and more controlled method of demolition and dust control.

Following this removal procedure, the structure interiors will be pre-wetted and moistened. The purpose of this action is to limit the potential for airborne dust during the above grade demolition operation. Pre-wetting operations will be accomplished using water trucks (for a portable water source), hoses and misting systems. Application will be carefully controlled to avoid accumulation of water within the areas and limit the potential for infiltration.

2.2 EXISTING SOIL DATA NEAR THE FORMER SPEISS-DROSS AND THAW HOUSE AREAS

Figure 2-1 shows arsenic profile data across the plant site. Using arsenic concentrations as an indicator, arsenic and metals are generally elevated in surface and near surface soils through out the plant area. Arsenic and metals generally decrease with depth.

Arsenic and metals data from surface and subsurface soil samples collected from monitoring wells and surface soil sample sites adjacent to or near the former speiss-dross area and near the thaw house are in Appendix A and are summarized on Table 2-1. Sample site locations are shown on Figure 2-1. Unpaved soils site (UPS-SS13) and monitoring well soil sample results (DH-13, DH-26, DH-27, and DH-30, DH-35 and DH-36) show elevated metals in near surface soils (0 to 6 feet) but generally decrease with depth below the five or six-foot interval. In the area, unpaved soil sample sites (UPS-SS06, UPS-SS08, LOS-SS14, LOS-SS116A and LOS-116B) and monitoring well DH-66 show soils in the thaw house area are also elevated metals in near surface soils but concentrations decrease significantly below the 4 foot depth interval.

Table 2-2 presents site wide surface soil statistics for the plant site. The source of this data is the 2003 Phase I RFI (ACI, 2003). In general, soils are sometimes above the site wide average for the site but less than maximum recorded values for the site.

Table 2-2 presents summary statistics for all surface soils sampled at the plant site (unpaved plant site soils, upper ore storage area, lower ore storage area, and rail road corridors), and Table 2-3 presents summary statistics for unpaved on-plant site soils areas. Comparison of the summary statistics with Table 2-1 shows that soil adjacent to the speiss/dross area and the thaw house in general are lower than mean surface soil concentrations for all soil sample areas and for unpaved areas on the plant site. The one exception was surface soils for DH-13, which is about 200 feet from the speiss-dross area (see Figure 2-1), which had the highest measured concentrations for arsenic, cadmium and lead, compared to other unpaved area sample sites.

2.3 GENERAL DEMOLITION PROCEDURES AND ASSOCIATED BUILDING DEMOLITION

The general demolition procedures for the 2007 Phase IV cleaning and demolition project are described in the 2007 Cleaning and Demolition Project (Work Plan, Asarco 2007b). These procedures include demolition of the remaining portions of the structures (see Figure 1-1). However, as described in Section 1.1.2 above, the work projected for the 2007 season has been modified to removal of structures necessary to accommodate equipment needed for construction of the speiss-dross area slurry wall (see Figure 1-2), and cleaning and demolition of the thaw house (see Figure 1-3). Prior to above grade structural demolition, it will be confirmed that:

- Pre-demolition decontamination and cleaning are complete;
- Any universal wastes (fluorescent light tubes, high intensity discharge (HID) lamps, light ballast containing PCBs, mercury containing equipment, and refrigerants (CFCs) are removed and properly disposed; and
- Required interior and exterior asbestos abatement operations are completed.

Pre-demolition decontamination and cleaning are described in Section 2.1 above. No universal wastes will be present in the remaining structures near the former speiss-dross area or the former thaw house. Handling and disposal of universal wastes are described in detail in the 2007 Work Plan (URS, 2007).

Asbestos abatement methods are also included in the 2007 Work Plan (URS, 2007). Asbestos transite is present within the exterior roof of the thaw house. This roofing will be subject to asbestos abatement activities prior to demolition. URS hired an asbestos abatement contractor (IRS Environmental) to perform asbestos abatement activities. Their work procedures and methods are described in Attachment B of the 2007 Work Plan, and are also included in this Work Plan as Appendix B.

2.3.1 Steel Structure Demolition

Steel structure demolition will be required for the remaining portion of the blast furnace and for the dross plant baghouse. This approach is described in the 2007 Work Plan and is described as follows:

The approach to building demolition is to use excavators (track-mounted) equipped with specialty attachments (such as shears, breakers and grapples) to structurally remove, bay by bay, the various structural members. The sequence approach is as follows:

- Each structure will be demolished using excavators with specialized attachments. Each truss frame structure between bays will be lowered and/or dropped to the ground by separating the portion of the tension members on the bottom cord to cause the truss to sag in between two bays.
- The excavator will then separate the remaining tension members of the truss to allow one end of the main truss to become separated from the supporting column.
- The other end (still connected) of the truss will be disconnected. The remaining roof traverse trusses, connecting main truss to main truss shall be removed to allow placement of the main truss behind the equipment for salvage. The remaining portion of the roof attached to the next bay section will be cut allowing for removal. The excavator will then drag the roof section behind for stockpiling and separation. This process is repeated for each of the numerous bays within each of the above referenced buildings.
- Steel columns will be cut with a shear at the base, and allowed to fall to the ground.

All material will be staged behind the working areas of the primary excavators, where they will be prepared by additional shears before they are loaded into dump trucks and hauled to the steel staging area just to the north of the Coverall

buildings. Materials will be continuously removed to allow other operations to proceed.

2.3.2 Concrete/Masonry Structure Demolition

The concrete/masonry demolition approach is described in the 2007 Work Plan and is described as follows:

A 100,000 lb excavator (or larger), equipped with a breaker, and a track loader will be utilized for the complete above grade concrete demolition operations of the various concrete and masonry structures. The exterior walls are constructed of either a concrete block material or a brick material. Starting at one end, URS/CWC will commence breaking from the top of the wall down from column to column. Once complete with the exterior wall at the end, URS/CWC will commence the removal of the concrete slab within the same constraints as the wall. This process is limited to the first exterior column line. Demolition of the elevated floor slab and walls will be completed in a top down approach for each individual column line. URS/CWC will break the closest interior columns under the roofs and floor, allowing the individual floor to sag. URS/CWC will work into the building, breaking the sagged slabs and allowing the debris to fall to the ground. As the floor slabs are removed and area is created in front of the equipment, URS/CWC will continue to break interior columns from the top down.

Once complete for that column, URS will repeat the same procedure for the remaining column lines. Utilizing a track loader, the broken concrete debris will be removed and transported to the designated staging area for placement into the Coverall building of the concentrate storage and handling building. The material will eventually be placed into the CAMU Phase 2 cell.

2.3.3 Demolition Material Stockpiling

Demolition debris (consisting of concrete and brick with the majority of dust removed) and associate debris be stockpiled in accordance with procedures outlined in the 2007 Work Plan, and further described as follows:

As steel structure and concrete demolition is progressing, material will be hauled and stockpiled in the designated Material Staging and Processing areas located within the demolition area footprints. At these locations, both general demolition debris and salvageable metal materials will be sized to meet the requirements of the final disposition location. Once general demolition debris has been segregated and sized, URS/CWC will load and transport the material to temporary storage in the Coverall building or concentrate storage and handling building. At the Coverall building or concentrate storage and handling building, the material will be dumped and consolidated as much as possible to maximize the interior storage space. With regards to salvageable metals, URS/CWC will size the material to its requirements and stage the material for eventual loading into railcars and/or trucks for transport to the recycling facility.

2.3.4 Debris Transportation

Demolition debris will be transported using procedures outlined in the 2007 Work Plan and is described as follows:

URS/CWC understands the critical nature of loading and transporting of waste debris from the demolition areas to the Coverall building or concentrate storage and handling building. Therefore, URS/CWC will take a proactive approach to ensure that the transportation of waste debris does not generate dust or spread waste debris outside the limits of the loading area. For all demolition debris, as further described below, URS/CWC will utilize water trucks and misting systems to keep debris moist during the demolition and loading process. These two operations will minimize airborne dust during the loading operation and be the first step in prevention during transportation.

URS/CWC anticipates utilizing 25-35 ton rock trucks and/or 10-wheel dump trucks, or a combination thereof, to haul the material to the Coverall building or concentrate storage and handling building. All trucks will be equipped with sealed tailgates that will be closed during times of hauling to ensure that debris is

not released outside the limits of the loading and dumping areas. Transport vehicles will be limited to a maximum 10 miles per hour while both on-site and during transport. Limiting speeds will prevent dust from become airborne during transport and will prevent the kick-up of dust due to rolling tire action.

Transport of waste on-site will follow prescribed paths, which will be determined during the course of demolition. Due to the changing nature of the site as demolition of structures progress, haul routes will require modification as site conditions dictate. However, once defined, these haul routes will be enforced to create dedicated routes that can be maintained to mitigate dust and debris migration, and prevent any potential spread of contamination. Maintenance of haul routes will be conducted through routine daily inspection to ensure that debris is not being released. Additionally, haul routes will be lightly wet with a water truck on a frequent basis throughout any given day to prevent the generation of dust due to vehicular traffic. As needed, URS/CWC will utilize the services of a street sweeper to clean the haul routes of accumulated debris and dust. This debris and dust sweepings will be placed into the Coverall building or concentrate storage and handling building and handled as demolition debris for eventual placement into the CAMU.

2.3.5 Final Cleaning Actions

Once demolition is complete and the debris has been removed, a final inspection of the demolished structure floor foot print of the area will be conducted. A visual survey will be conducted to catalog any area within the structure footprints where asphalt or concrete is not present and underlying soils may have been exposed to dust or other high metal concentration materials. The survey will also document the condition of asphalt or concrete within the structures and floors. The documentation will include a description and photographs. All exposed soil areas, broken or severely cracked asphalt or concrete areas will be mapped and recorded on plan views of the demolished structures.

2.3.5.1 Exposed Soil Area Sampling and Cleaning

If exposed soil areas are encountered within the cleaning and demolition footprints, the exposed soil area will be field tested using a portable X-Ray Fluorescence (XRF) analyzer. Exposed soil areas will be field tested for concentrations of arsenic, copper, cadmium, lead and zinc. The soil sample collection and analytical matrix is summarized in Table 2-4.

Since dust metal concentrations in former processing areas such as the former speiss-dross handling area or the thaw house may range in the percent range (10,000 mg/l to 200,000 mg/l), XRF results in this concentration range will be indicative of remaining processing dust or materials residuals, or impacted soils. Where exposed soil areas within demolition structure footprints have been exposed to dust or other high metal concentration materials, limited excavation of dust material residuals and impacted soils will be conducted. The criteria for excavation is as follows:

- Excavation of obvious dust or impacted soil based on visual observation. Ore processing dust is generally very fine grained and gray to black in color. This generally contrasts with native soils which can be fine to coarse grained, typically show traces of sand and gravel, and are generally a tan or brown color where they have not been impacted.
- Exposed soils or materials within demolished structures footprint in the former speiss-dross area or the thaw house that exceed the unpaved on-plant site area soils arithmetic mean for the 2-4 foot interval as shown on Table 2-3 and on summarized in Table 2-4 will be excavated. Since soil concentrations are elevated throughout unpaved areas on the plant site, the arithmetic mean for unpaved plant site soils in the 2-4 foot interval has been arbitrarily selected as a relatively conservative target for soil removal. Soils will be excavated until:
 - The values for arsenic, copper, cadmium, lead and zinc are below the arithmetic mean as shown in Table 2-3 and as summarized in Table 2-4, or
 - The practical excavation limit of excavation equipment is reached (depending on access, this is typically 12 to 15 feet), or

- The water table is encountered.
- Following excavation, samples collected from the deepest interval sampled will be analyzed using the SPLP Method EPA 1311 to document metal concentrations in test leachate in the remaining soil.

The above exposed soil area cleanup criteria is summarized on Table 2-4.

Surface and subsurface soil samples will be collected from exposed soil areas using the same techniques and procedures used for Interim Measures (IM) and RCRA Facility Investigation (RFI) activities, as described in the IM and RFI Work Plans (Hydrometrics 1999b and Hydrometrics 2000). Surface soil sample sites are shown in Figures 2-3 and 2-4.

A total of 5 surface (0-4 inch increment) soil samples will be collected from each sample site in identified exposed soil areas and composited into one representative sample of the area. Surface soil samples will be collected using hand tools (hand shovel, trowels, or hand augers). The samples will be stored in ziplock baggies and archived for future analysis (either XRF for total metals or SPLP), or analyzed on site using a field portable XRF. All analytical work will be conducted before the 6-month holding time limit for metals. The location of each soil sampling site will be cataloged using sample numbers and GPS coordinates. Sites with visually obvious dust or that exceed the numerical criteria described above and in Table 2-4 will be considered candidates for subsurface soil excavation. The sampling Standard Operation Procedures (SOPs) and analytical parameters and methods are summarized in Table 2-4. For convenience, a table of relevant SOPs from the IM and RFI work plans are listed in Appendix C of this Work Plan.

Sub-surface samples will be collected directly from the soil excavation equipment bucket in the following increments until excavation depth criteria described above and summarized in Table 2-4 are met. Sub-surface soil increments are: 4-12", 1-2', 2-4', 4-6', 6-8', 8-10', 10-12', and 12-15', as necessary. One soil sample will be collected

directly from the backhoe bucket for each increment within an identified exposed soil sample area. Excavation and sampling will continue using the procedure described above until numeric criteria are met, or practical excavation limits prohibit further excavation. Samples will be analyzed in the field using a portable XRF and stored in ziplock baggies and archived until the project is complete. Any future analytical work (primarily SPLP) will be conducted before the 6-month holding time limit for metals.

2.3.5.2 Asphalt and Concrete Floor Area Sampling and Cleaning

The final cleaning of asphalt and concrete covered demolition footprint areas will involve a three-phased approach. First, the asphalt or concrete footprint will undergo a rough cleaning using conventional scraping and shoveling methods to remove any solid residues that may have accumulated during the demolition process. Second, the asphalt or concrete footprint will be mechanically swept. The use of a mechanical sweeper will remove surface materials that may not be completely removed using scraping and shoveling techniques. Finally, if necessary, the asphalt or concrete footprint will be cleaned using a high-velocity, truck mounted vacuum. This final cleaning method will remove any fine material, particularly along the interfaces between the floor and building columns, wall foundations, and support walls.

2.3.6 Capping of Demolished Areas

The areas where above grade demolition activities have been completed will be sealed in a manner that will mitigate the infiltration of water below the foot print area through existing or created cracks and crevices. Demolition foot print areas will be covered as delineated on Figure 2-2 with 10-oz geotextile and a geomembrane cap of 24-mil RPE liner.

Upon completion of the demolition operations and area clean-up, URS/CWC will remove all debris and items from the slab that could possibly penetrate the subject geotextile and geomembrane. URS/CWC will utilize the existing on-site fumed slag as fill material over the remaining demolition slabs/areas. This fumed slag will be placed and rough graded to create the positive drainage required per the Construction Document Drawings.

The fumed slag has been used as a grading material at the plant site in the past and possesses good physical characteristics for fill or sub-foundation uses (granular material and compacts wells). Although fumed slag contains elevated total metal concentrations, the metals are bound in a silicate-iron matrix with characteristics of low metal leachability. The potential for metal migration from the fumed slag is low. In response to EPA's July 6, 2006 comments, Asarco provided the rationale for using fumed slag for backfilling purposes, including study results derived from the RCRA Consent Decree investigations. The slag-related investigative results contained in the Current Condition Release Assessment (CC/RA, January 1999) and qualitative analyses of fumed slag (May 2001) are attached as Appendix D. In April 2005, Montana Department of Environmental Quality representatives collected fumed slag samples from the East Helena Plant to assess the potential environmental impacts from its use as an iron substitute within the cement manufacturing industry. A copy of the April 2005 fumed slag sampling event results is attached as Appendix D. A July 2006 Department Environmental Impact Statement (EIS) may contain additional slag related information.

The geotextile and geomembrane will be laid, seamed, and secured as detailed. Additionally, sandbags will be placed intermittently within the center liner area to prevent the liner from being picked up by wind uplift or other forces. This will be done in sufficient quantity to ensure the liner stays in place. As an added preventative measure, URS/CWC will utilize sandbags made of UV Resistant 9-mil PE, which will provide superior UV resistance (compared to standard plastic woven sandbags) to prevent breakdown by sunlight.

URS/CWC will utilize the services of a subcontractor, Northwest Lining & Geotextile Products, Inc., for the installation of the temporary demolition caps. Complete details for the geotextile, geomembrane, and liner attachment to be utilized are in Attachment C of the 2007 Cleaning and Demolition Work Plan (URS, 2007) and are also in Appendix E of this Work Plan.

2.3.6.1 Interim Cap Techniques, Procedures, and Materials

The interim caps will be constructed to cover newly exposed footprints in the demolition areas. Depending on when the work is initiated, work sequencing and/or weather conditions, the interim cap installation may be conducted before final removal of material and impacted subsurface soils in exposed areas (see 2.3.5.1 above). Scheduling is discussed further in Section 3.0.

The interim cap details and specifications are shown on Figure 2-5. In general, from the top down, the interim cap will consist of the following:

- Sand bags to hold down the interim cover during windy periods;
- A 24-mil reinforced polyethylene (RPE) with the PRE seams overlapped 3 inches and sealed with a butyl rubber seaming tape;
- A minimum 10 ounce non-woven geotextile;
- A prepared sub-grade consisting of fumed slag fill for grading purposes; and
- Existing soils, concrete/asphalt slabs and/or concrete foundations.

2.3.6.2 Maintenance of Interim Cap Site Inspection

Periodic inspections of the interim cap will be conducted to ensure that the interim cap systems are performing adequately and to identify problems and provide proper maintenance of interim cap systems. The inspection program will involve three types of inspections: (1) informal inspections, (2) periodic technical inspections, and (3) special inspections after extreme events.

The informal inspection is actually a continuing effort by on-site personnel, performed in the course of their normal duties. Periodic technical inspections and inspections after extreme events will be performed by onsite Asarco staff (or other technical representatives) familiar with the design and construction of the cover systems. The periodic technical inspection will be performed monthly to document the condition of the cap components. Special inspections are very similar to periodic technical inspections but are performed only after an extreme event such as a rare rainstorm, tornado, or earthquake.

The inspection of the cover systems will typically involve walking the entire site in a systematic fashion that ensures a comprehensive review. If any problem or deficiency is found, the inspector should record the location on a field sketch. A complete description of the affected area, including all pertinent data (i.e., size of the area and other descriptive remarks such as exposed synthetic materials) should be recorded on the appropriate reporting forms. An accurate and detailed description of observed conditions will enable a meaningful comparison of conditions observed at different times.

Photographs may be helpful in documenting problems. Provisions should be made to keep a photographic log of problems, repairs, and general site conditions. This log will provide valuable information when evaluating the performance of the cover system and when planning repair strategies.

It is important to have a record of site conditions at various stages after capping. Good documentation will provide valuable information to help maintenance and repair planning. Inspection checklists to assist in the inspection and documentation procedures should be developed and modified as needed throughout the interim capping period. The checklist will (at a minimum) contain items to evaluate such as membrane condition, sand bag condition, liner seams, liner/concrete attachments and site drainage. A copy of an example inspection form is attached in Appendix F.

2.3.6.3 Site Security

The interim cap will be contained within the fenced Asarco facility and will be kept secured so that people or animals do not disturb the cap. Site access by ongoing plant or demolition operations will be limited through the use of barricades, barrier tape, or temporary fencing. Plant personnel will advise contractors conducting site activities of access limits within or near capped areas.

2.3.6.4 Site Maintenance

As shown in Table 2-5, there are four different types of maintenance tasks listed by priority rather than by frequency. Table 2-5 is provided as a guide to prioritize the different types of maintenance activities in proper perspective. The different types of maintenance are also discussed in the following subsections.

1. Emergency maintenance - Emergencies are situations arising unexpectedly that require urgent attention. Often, immediate response must be provided to avert potential serious damage. Provisions for emergency repair/damage control activities must therefore be in-place prior to the occurrence. Toward this end, an Emergency Contacts list will be prepared and kept current, and include local emergency response organizations, assigned maintenance personnel, and agency and owner representatives. Table 2-6 provides a partial list of emergency contacts.
2. Preventative maintenance - Preventative maintenance will be performed to extend the life of equipment and structures. With the exception of routine surveillance and inspections, preventative maintenance tasks should be scheduled in accordance with the recommendations of the material and equipment manufacturers. Scheduled inspection and maintenance of all site facilities will help ensure that potential problems are discovered and corrected before they become serious, as well as providing for the performance of periodically required upkeep. During routine inspections, the Asarco personnel should be alert for any abnormal conditions, which could indicate potential problems.
3. Corrective maintenance - Corrective maintenance consists of repair and other non-routine maintenance. Asarco personnel must always be ready to handle these tasks as the need arises. Corrective maintenance procedures should follow the equipment or material manufacturer's recommendations. In planning for the corrective maintenance, arrange for the assistance of an engineer or manufacturer's representative, if necessary.

4. Housekeeping - Maintaining well-kept facilities indicates pride on the part of the Asarco personnel, and provides for good and efficient operations. Well-kept property cultivates good neighbor relations with adjacent property owners. Housekeeping tasks may include collecting/disposing of litter or debris and maintaining access barriers.

2.3.7 Storm Water Pollution Prevention Plan

Storm water during demolition will be managed in accordance with the Storm Water Pollution Prevention Plan (SWPPP) outlined in the 2007 Cleaning and Demolition Work Plan (URS, 2007) and is described as follows:

URS understands and appreciates the importance of the SWPPP due to the present concerns and conditions of the ASARCO facility. URS will utilize Best Management Practices (BMPs) for various construction activities. From the existing SWPPP, applicable information, such as management practices for the hazardous material storage areas, will be incorporated into URS' Best Management Practices. Other material handling practices related specifically to the decontamination and demolition activities will be addressed. Management practices for cross-contamination control will be addressed, such as avoiding spills from construction vehicles during hauling, loading, servicing, and fueling and controlling contaminated soil erosion. Changes to the storm drainage system due to demolition will be addressed as the structures are demolished and the site conditions change.

Standard erosion control measures will also be utilized, including controlling dust, providing straw bales around storm drain inlets, placing sand-bags at critical perimeter locations, and avoiding off-site tracking of debris from vehicles. Provisions to avoid ponding and maintain excavations free of storm water runoff will be addressed. Typically, this will involve filling these locations prior to storms. Measures for erosion control will be added as the project progresses.

Inspection of the erosion control measures will be made prior to, during, and after storms to evaluate the adequacy of these measures and to manage corrections as necessary.

Documentation of the inspection and correction activities will be maintained, as required. Generally, the inspection and documentation will be done by the Project Manager/Engineer. Copies of the documentation will be forwarded to ASARCO for review and records.

2.3.8 Dust Control Plan

Dust control will be performed in accordance with the dust control plan outlined in the 2007 Cleaning and Demolition Work Plan (URS, 2007) and is described as follows:

The general requirements of this plan are to provide adequate resources to control dust and to detail the means and methods that will be utilized to implement dust control measures during the cleaning and demolition in order to support scheduled activities/operations within the ASARCO facility. URS/CWC's dust control measures are designed to control the emission of visible fugitive nuisance dust. These controls will be accomplished through the use of administrative, engineering, and physical controls that will include, but not be limited to the following:

- Moistening surfaces with water;
- Application of dust suppressants or encapsulates, where applicable;
- Minimizing soil, road, and surface disturbances;
- Minimize dusting exposure periods and wind erosion before dust-abatement measures are applied;
- Curtailing of work activities during high wind conditions (over 15 MPH average hourly rate);
- Controlling vehicle/equipment speeds (10 MPH maximum);
- Restricting traffic to designated roads/corridors; and
- Equipment Selection.

URS/CWC considers the mitigation of airborne dust generation to be a priority. Throughout the project, URS/CWC will take all necessary steps to effectively control dust in the working area during demolition operations. As previously mentioned,

URS/CWC will remove at ground level and at all accessible areas all gross debris accumulation that could be a source of airborne dust. Furthermore, URS/CWC will institute a program of pre-wetting and moistening building interiors and horizontal surfaces where dust has accumulated. This pre-wetting of the structure interiors will limit the ability of remaining dust to become airborne during the demolition process. As the structures are demolished, the dust will be allowed to fall to the ground where it can be gathered, containerized appropriately, and properly managed.

2.3.8.1 Application with Water During Demolition

The use of water will be the main source for dust control. URS/CWC will keep all work areas (including roads, access points) within the facility, wet during work activities. This will be accomplished by using existing 2,000-gallon water trucks. Each water truck will be equipped with spray-bars for wetting haul and access roads; water cannons and necessary hoses, valves, and fittings will be used to provide spray water for dust control where needed in remote areas where a water truck can not be utilized.

Furthermore, during the life of the project water truck(s) will be available during the actual demolition of the above grade steel and concrete structures. Localized fine water spray pointed at the source of demolition (and therefore dust source) reduces dust particles to become airborne. Additionally, URS will utilize a Dust Boss™ water misting system. The Dust Boss™ is a fully automatic, oscillating ducted fan with a high pressure misting system that creates a high performance dust barrier. Dust Boss™ uses a high pressure misting system to create an ultrafine mist that attracts dust and drives it to the ground. During structure demolition, this equipment will be pre-positioned in an area that will ensure the generated dust barrier is effective. To minimize water run-off, both the water truck and Dust Boss™ water supply will be used only if necessary.

2.3.8.2 Dust Control During Loading and Debris Transportation

During loading, unloading, and material transfer operations, URS/CWC will minimize material drop heights to reduce emission of fugitive dust. During loading of demolition debris, additional spray water will be utilized to control fugitive dust emissions from this

operation. After demolition debris is loaded into the truck beds, URS/CWC will then moisten the debris payload down prior to the vehicle leaving the loading areas.

Transport vehicles will be limited to a maximum 10 miles per hour while both on-site and during transport. Limiting speeds will prevent dust from become airborne during transport and will prevent the kick-up of dust due to rolling tire action.

2.3.8.3 Dust Suppressant

The primary dust control measure to be used will be water. However, the application of an accepted dust suppressant dispersed from the water truck or special equipment as a dust suppressant may be required during periods of time that the application of water alone is inadequate for dust control. Dust suppressant product information and MSDSs will be submitted for approval prior to the usage and/or application.

2.3.8.4 Area Control

URS/CWC will use specific loading areas for each decontamination/demolition removal location to minimize disturbances and control material transfer operations. During the demolition of each structure, URS/CWC will designate a staging and loading area directly adjacent to each structure. Often this area will be within the footprint of the structure being demolished. This staging and loading area, specific to each structure, will be kept constant and will be maintained to control the migration of dust and debris from moving material unnecessarily.

2.3.8.5 Water Source

URS/CWC will utilize the existing ASARCO provided fill station, adjacent to Upper Lake, as the source of non-potable water to be utilized for dust suppression operations.

2.3.8.6 Field Quality Control

URS/CWC Project Staff (i.e., Project Superintendent, Foreman, H&SP) will inspect work areas daily to assess the need for implementation (or additional implementation) of dust control measures.

2.3.8.7 Overall Dust Control Application

URS/CWC will control fugitive dust emissions by using the following overall methods:

- Provide dust suppression (water) before, during, and after demolition of a structure, provided it is safe to do so.
- In cases where structures are to be dropped (stack demolition, elevated structures), URS/CWC will moisten the targeted drop area prior to the demolition of the structure.
- Provide dust control during material sizing and loading operations.
- Control material drop heights during loading, unloading and material transfer operations.
- Minimize and control material handling operations.
- On-site vehicular traffic control and haul road maintenance
- If necessary, URS/CWC will apply other approved methods for control of dust during specific procedures.

3.0 SCHEDULE

A preliminary schedule for the 2007 cleaning and demolition, and soil sampling project is in Figure 3-1. The schedule is preliminary and is dependent on the sequencing of several other cleaning and demolition projects that are addressed in the Cleaning and Demolition Plan (URS, 2007). Key events include:

- Demolition of structures in the former speiss-dross area.
- Sample collection in exposed areas within the foot print of structures demolished in the speiss-dross area and the thaw house area.
- Initial site preparation including interruption of utilities that are in the construction pathway for the speiss-dross slurry wall.
- Construction of the slurry wall.
- Excavation and any necessary sampling in exposed soil areas that are within the foot print of demolished structures.
- Interim Cap.

Depending on when the work is initiated, work sequencing and/or weather conditions, the interim cap installation may be conducted before final removal of material and impacted subsurface soils in exposed areas. In this case, the final cleanup of material and associated impacted soils within the foot print would be conducted in the 2008 season.

4.0 REFERENCES

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TABLE 2-1. SUMMARY OF SOIL SAMPLE DATA ADJACENT TO THE FORMER SPEISS-DROSS AREA AND ADJACENT TO THE THAW HOUSE

0"-4" Depth Interval	Surface Soil Sample Site Number									Monitoring Well Soil Sample Site Number			
Parameter	UPS-SS-13	UPS-SS06	UPS-SS08	LOS-SS14	LOS-116A	LOS-SS16B	DH-13	DH-26	DH-27	DH-30	DH-35	DH-36	DH-66S
ARSENIC (AS) TOT	1748	45	203	1007	276	261	3163				2346		
COPPER (CU) TOT	8221	179	787	1522	797	812	17125				8679		
CADMIUM (CD) TOT	843	92	80	277	208	216	1610				538		
LEAD (PB) TOT	14989	630	2624	7975	3331	3361	24200				12879		
ZINC (ZN) TOT	8045	350	1347	4387	2668	3002	14450				8672		
4"-12" Depth Interval													
ARSENIC (AS) TOT	1924	1879	83	1353	21		389						
COPPER (CU) TOT	7438	3892	259	1888	40		930						
CADMIUM (CD) TOT	501	701	48	441	<10		84						
LEAD (PB) TOT	14334	24682	1169	15362	114		11290						
ZINC (ZN) TOT	9131	18867	828	6263	96		588						
0'-2' Depth Interval													
ARSENIC (AS) TOT	1924	1879	83	1353	21		389						1052
COPPER (CU) TOT	7438	3892	259	1888	40		930						2472
CADMIUM (CD) TOT	501	701	48	441	<10		84						392
LEAD (PB) TOT	14334	24682	1169	15362	114		11290						19608
ZINC (ZN) TOT	9131	18867	828	6263	96		588						10780
1'-2' Depth Interval													
ARSENIC (AS) TOT	1894	48	80	1100	17		28			1288		447	
COPPER (CU) TOT	7092	154	148	1213	47		88			4970		873	
CADMIUM (CD) TOT	312	28	33	661	<10		2			234		34	
LEAD (PB) TOT	19676	694	913	12027	127		209			11574		4300	
ZINC (ZN) TOT	13821	605	612	10971	123		66			26012		28454	
2'-4' Depth Interval													
ARSENIC (AS) TOT	415	27	48	210	15	18	65	450	32	6523	1491	23	
COPPER (CU) TOT	1695	133	147	425	38	23	75	350	63	110	6166	54	
CADMIUM (CD) TOT	50	17	28	40	<10	<10	3	60	1	2855	445	<10	
LEAD (PB) TOT	9636	945	722	1760	45	47	273	25500	9	19079	8529	80	
ZINC (ZN) TOT	41455	532	493	1715	74	88	111	520	140	1045	7505	450	
3'-4' Depth Interval													
ARSENIC (AS) TOT		14			12		32						127
COPPER (CU) TOT		43			23		25						535
CADMIUM (CD) TOT		<10			<10		1						97
LEAD (PB) TOT		110			26		63						2569
ZINC (ZN) TOT		103			55		52						1390
4'-6' Depth Interval													
ARSENIC (AS) TOT					15	22	27	275	132	6739	91	27	
COPPER (CU) TOT					22	35	31	14	76	111	207	83	
CADMIUM (CD) TOT					<10	<10	1	2	2	3011	<10	<10	
LEAD (PB) TOT					17	29	86	23	22750	19549	444	43	
ZINC (ZN) TOT					57	69	42	38	105	1082	648	192	
6-8' Depth Interval													
ARSENIC (AS) TOT					15-17"								
COPPER (CU) TOT					11			164	162		222	21	178
CADMIUM (CD) TOT					18			28	35		138	76	508
LEAD (PB) TOT					<10			3	2		<10	<10	103
ZINC (ZN) TOT					17			105	7		182	23	3086
					42			100	38		113	70	1911
8-10' Depth Interval													
ARSENIC (AS) TOT								172	74	754	83		
COPPER (CU) TOT								30	77	190	84		
CADMIUM (CD) TOT								1	1	1465	<10		
LEAD (PB) TOT								21	34	127	38		
ZINC (ZN) TOT								43	72	1175	87		
10-12' Depth Interval													
ARSENIC (AS) TOT						81		100		731	72		15
COPPER (CU) TOT						24		48		89	114		45
CADMIUM (CD) TOT						<10		3		1081	<10		<10
LEAD (PB) TOT						25		91		127	56		22
ZINC (ZN) TOT						66		100		1281	109		88
15-17' Depth Interval													
ARSENIC (AS) TOT								92		160	90	<10	27
COPPER (CU) TOT								65		76	92	66	49
CADMIUM (CD) TOT								1		1686	<10	<10	<10
LEAD (PB) TOT								23		93	41	21	25
ZINC (ZN) TOT								62		774	63	116	42
20-22' Depth Interval													
ARSENIC (AS) TOT								100		502	128	88	
COPPER (CU) TOT								90		138	66	75	
CADMIUM (CD) TOT								2		610	57	<10	
LEAD (PB) TOT								42		31	42	23	
ZINC (ZN) TOT								81			83	73	
25-25.5' Depth Interval													
ARSENIC (AS) TOT								1434	122	100	221	161	14
COPPER (CU) TOT								200	74	32	70	62	77
CADMIUM (CD) TOT								10	5	11	567	<10	<10
LEAD (PB) TOT								120	440	14	26	18	47
ZINC (ZN) TOT								1013	425	720	77	71	53
24-26' 25-27'													

TOT = Total
All analytical values are in mg/Kg

TOT = Total
All analytical values are in mg/Kg
Source: Appendices 2 and 7, Phase I RFI Report, ACI, 2003.

Note: Depth intervals have been normalized for comparison purposes. For example, the 4-6 foot increment in some samples may actually be a 3-5 foot sample increment. The actual sample increments are in the data reports included in Appendix 1

Shading = No data available for these depth intervals

TABLE 2-2. SUMMARY STATISTICS FOR SURFACE SOILS

0"-4" Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	173/183	2159	1028	0.01	35500	SS-12	3753	16.5	26	432
COPPER (CU) TOT	175/183	5522	3225	0.01	35750	RC-SA02D-1, 4/24/2001	6917	16.3	69	1127
CADMIUM (CD) TOT	167/183	1225	354	0.05	23400	SS-18	2830	0.24	816	196
LEAD (PB) TOT	177/183	16615	10875	0.01	73866	RC-SS17, 4/18/01	17967	11.6	296	3439
ZINC (ZN) TOT	179/183	13672	7916	0.05	88519	RC-SS25, 4/25/01	17388	46.9	63	2940

4"-12" Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	144/155	1133	503	0.10	8753	RC-SS05C-2, 4/6/2001	1518	16.5	17	276
COPPER (CU) TOT	148/155	2624	1319	0.10	16054	RC-SS05C-2, 4/6/2001	3421	16.3	37	604
CADMIUM (CD) TOT	136/155	662	239	0.05	13992	RC-SS06, 4/06/01	1436	0.24	535	128
LEAD (PB) TOT	152/155	12717	7125	0.05	77220	RC-SS07D, 4/09/01	16583	11.6	210	2431
ZINC (ZN) TOT	153/155	9791	6263	0.05	57288	RC-SA06, 4/24/01	11284	46.9	53	2492

1'-2" Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	148/154	825	338	0.03	9256	UOS-SS11-3, 10/3/2001	1405	16.5	13	209
COPPER (CU) TOT	148/154	1999	790	0.01	64908	UPS-SS01-3, 3/20/2001	5521	16.3	26	416
CADMIUM (CD) TOT	121/154	415	111	0.02	10110	RC-SS06, 4/06/01	980	0.24	303	73
LEAD (PB) TOT	152/154	8147	3219	0.03	64307	UPS-SS01, 3/20/01	11119	11.6	136	1574
ZINC (ZN) TOT	153/154	6552	4166	0.05	35772	RC-SS20, 4/18/01	7035	46.9	38	1795

2'-3" Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	116/128	518	130	0.012	4455	RC-SS06-4, 4/6/2001	906	16.5	6	97
COPPER (CU) TOT	122/128	1130	396	0.004	6741	RC-SS08-4, 4/9/2001	1579	16.3	14	229
CADMIUM (CD) TOT	92/128	397	44	0.003	13588	RC-SS06, 4/06/01	1316	0.24	174	42
LEAD (PB) TOT	123/128	5153	1193	0.003	37460	LOS-SS06, 4/06/01	7888	11.6	60	696
ZINC (ZN) TOT	127/128	6070	1731	0.032	56395	LOS-SS05, 4/05/01	9052	46.9	21	979

3'-5" Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	36/39	300	165	10.00	1608	UOS-SS05-5, 4/17/2001	407	16.5	7	115
COPPER (CU) TOT	39/39	671	286	21.00	5763	UOS-SS07-5, 4/17/2001	1051	16.3	15	239
CADMIUM (CD) TOT	28/39	202	51	5.00	1430	RC-SS07C, 4/9/01	349	0.24	203	49
LEAD (PB) TOT	39/39	3547	1885	27.00	15928	UOS-SS05, 4/17/01	4456	11.6	93	1078
ZINC (ZN) TOT	39/39	3159	1000	45.00	12826	LOS-SS10, 4/6/01	3904	46.9	21	980

5'-8" Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	30/31	304	49	11.00	2553	RC-SA08A-5, 4/25/2001	592	16.5	4	73
COPPER (CU) TOT	31/31	715	116	17.00	6181	RC-SS27-6, 4/9/2001	1339	16.3	11	185
CADMIUM (CD) TOT	24/31	131	32	5.00	741	RC-SS27, 4/9/01	188	0.24	170	41
LEAD (PB) TOT	31/31	5463	1593	23.00	26889	RC-SS27, 4/9/01	7733	11.6	109	1267
ZINC (ZN) TOT	31/31	4987	1354	46.00	39575	RC-SA06, 4/24/01	8190	46.9	26	1219

8'-11' Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	4/4	408	181	16.00	1255	RC-SA08B-8, 4/25/2001	570	16.5	10	160
COPPER (CU) TOT	4/4	779	669	44.00	1734	RC-SA08B-8, 4/25/2001	704	16.3	26	429
CADMIUM (CD) TOT	2/4	68	8	5.00	251	RC-SA08B, 4/25/01	122	0.24	68	16
LEAD (PB) TOT	4/4	1126	182	176.00	3962	RC-SA08B, 4/25/01	1891	11.6	34	390
ZINC (ZN) TOT	4/4	2531	360	138.00	9265	RC-SA08B, 4/25/01	4492	46.9	13	618

TOT = Total

1/2 the detection limit used for non-detected values.

All analytical values are in mg/Kg

Source: Table 2-3-1, Phase I RFI Report, ACI, 2003.

TABLE 2-3. SUMMARY STATISTICS FOR SURFACE SOILS IN THE UNPAVED ON-PLANT SITE AREA

0"-4" Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geomean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	19/19	2174	460	0.10	17075	UPS-SS1, 3/20/01 UPS-SS4, 3/16/01 SS-31	3970	16.5	19	315
COPPER (CU) TOT	19/19	5119	1100	0.10	35350		8806	16.3	44	709
CADMIUM (CD) TOT	18/19	662	433	0.05	3069		954	0.24	1121	269
LEAD (PB) TOT	18/19	9024	8813	0.05	39046		10263	11.6	281	3256
ZINC (ZN) TOT	18/19	12039	6421	0.05	84650		21706	46.9	71	3318

4"-12" Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	16/18	678	349	0.10	2148	UPS-SS1, 3/20/01 UPS-SS6, 3/20/01 UPS-SS14, 3/20/01	723	16.5	10	160
COPPER (CU) TOT	18/18	1970	754	0.10	9395		2673	16.3	20	326
CADMIUM (CD) TOT	16/18	224	88	0.05	901		267	0.24	263	63
LEAD (PB) TOT	17/18	7345	4625	0.05	24682		7703	11.6	114	1322
ZINC (ZN) TOT	17/18	9619	7874	0.05	41322		11105	46.9	33	1548

1'-2' Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	14/15	610	164	0.10	3100	UPS-SS13, 3/20/01 UPS-SS1, 3/20/01 UPS-SS12, 3/16/01	941	16.5	7	119
COPPER (CU) TOT	15/15	5385	206	0.10	64908		16574	16.3	17	274
CADMIUM (CD) TOT	11/15	92	38	0.05	312		102	0.24	117	28
LEAD (PB) TOT	14/15	8304	968	0.05	64307		17002	11.6	73	846
ZINC (ZN) TOT	14/15	4921	1647	0.05	22123		6868	46.9	15	722

2'-4' Depth Interval

Parameter	Detection Frequency	Arithmetic Mean	Median	Minimum	Maximum	Location of Maximum	Standard Deviation	Geo. Mean Background	Enrichment Factor	Geometric Mean
ARSENIC (AS) TOT	12/13	165	130	10	465	UPS-SS1, 3/20/01 UPS-SS13, 3/20/01 UPS-SS13, 3/20/01	162	16.5	5	84
COPPER (CU) TOT	13/13	778	147	14	3522		1095	16.3	13	218
CADMIUM (CD) TOT	8/13	35	17	5	107		35	0.24	80	19
LEAD (PB) TOT	13/13	2080	932	23	9636		2884	11.6	52	598
ZINC (ZN) TOT	13/13	7881	532	15	41455		13187	46.9	18	852

TOT = Total

1/2 the detection limit used for non-detected values.

All analytical values are in mg/Kg

Source: Table 2-3-3, Phase I RFI Report, ACI, 2003.

TABLE 2-4. SOIL SAMPLE COLLECTION AND ANALYTICAL MATRIX

Sample Location	Purpose	Sample Depth Intervals ⁽¹⁾	Number of Sampling Events	Sampling Standard Operating Procedures	Analytical Parameters	Methods	Project Detection Limit Goal	Excavation Concentration Removal Limits (mg/kg or ppm)	Soil Excavation Removal and Sampling Protocols in Unpaved Bare Soil Areas Within the Demolition Foot Print Area
Highline Tressel Foot Print (10 Sites) Contractors Lunch Room (2 Sites) Garage (1 Site) Thaw House (5 Sites)	Remove and impacted soils in exposed or unpaved areas within the structure demolition foot print. Determine depth of excavation.	Sample from Excavator Bucket. Sample intervals: 0-4" 4"-12" 1'-2' 2'-4' 4'-6' 6'-8' 8'-10' 10'-12' 12-15'	1	HF-SOP-2 HF-SOP-4 HF-SOP-5 HF-SOP-7 HF-SOP-29 HF-SOP-31 HF-SOP-58 HS-SOP-6 HS-SOP-13 HS-SOP-57	As Cd Cu Pb Zn	XRF XRF XRF XRF XRF	10 ppm 10 ppm 10 ppm 10 ppm 10 ppm	165 778 35 2080 7881 Source: Table 3-4, arithmetic mean for the 2 to 4 foot increment.	Obvious impacted soils are removed based on visual observation (fine texture, dark gray color). Excavation continues until: - The values for As, Cd, Cu, Pb, Zn are below removal limits - The practical limit of excavation equipment is reached (typically 12 to 15 feet) - The water table is encountered. The final sample increment is retained and analyzed for SPLP.
	Document metal concentrations in test leachate from the SPLP testing procedure	Final increment sampled from excavator bucket and sampled for metals and analyzed by XRF	1		As Cd Cu Pb Zn	SPLP (EPA 1312) SPLP (EPA 1312) SPLP (EPA 1312) SPLP (EPA 1312) SPLP (EPA 1312)	0.1 mg/l 0.1 mg/l 0.1 mg/l 0.1 mg/l 0.1 mg/l		

(1) Sample depths are approximate; actual depths will be based on field conditions.

(2) Duplicates will be collected at a minimum frequency of 1 per 20 field samples. Duplicates for SPLP analysis will be submitted at a frequency of 1 per 20 samples selected for SPLP.

(3) Detection limits for SPLP analysis have been set at 100x below regulatory limits.

(4) Sample site locations will be surveyed by GPS during or after samples are collected.

TABLE 2-5. PRIORITY OF MAINTENANCE TASKS

Priority	Type of Maintenance	Description and Example
1	Emergency	A situation requiring immediate attention (for example, fire or flood).
2	Preventative	Scheduled inspection and minor repairs carried out during inspection (for example, cleaning of membrane liner).
3	Corrective	Corrective maintenance required as a direct result of scheduled inspection (for example, repair of torn membrane liner).
4	Housekeeping	Routine housekeeping of buildings and grounds (for example, disposal of debris and general housekeeping).

**TABLE 2-6. EMERGENCY NOTIFICATION
CONTACTS AND PHONE NUMBERS**

General Emergency Numbers:

Fire Department	911
Ambulance	911
Police	911

Corporate Resources

ASARCO LLC

Blaine Cox	(East Helena Smelter) Cell	(406) 227-4098 (406) 459-8542
Jon Nickel	(East Helena Smelter)	(406) 227-4529

OTHER RESOURCES:

U.S. EPA (24-hour emergency)	(206) 553-1263
Superfund/RCRA Hotline	(800) 424-9346
Hydrometrics, Inc	(406) 443-4150

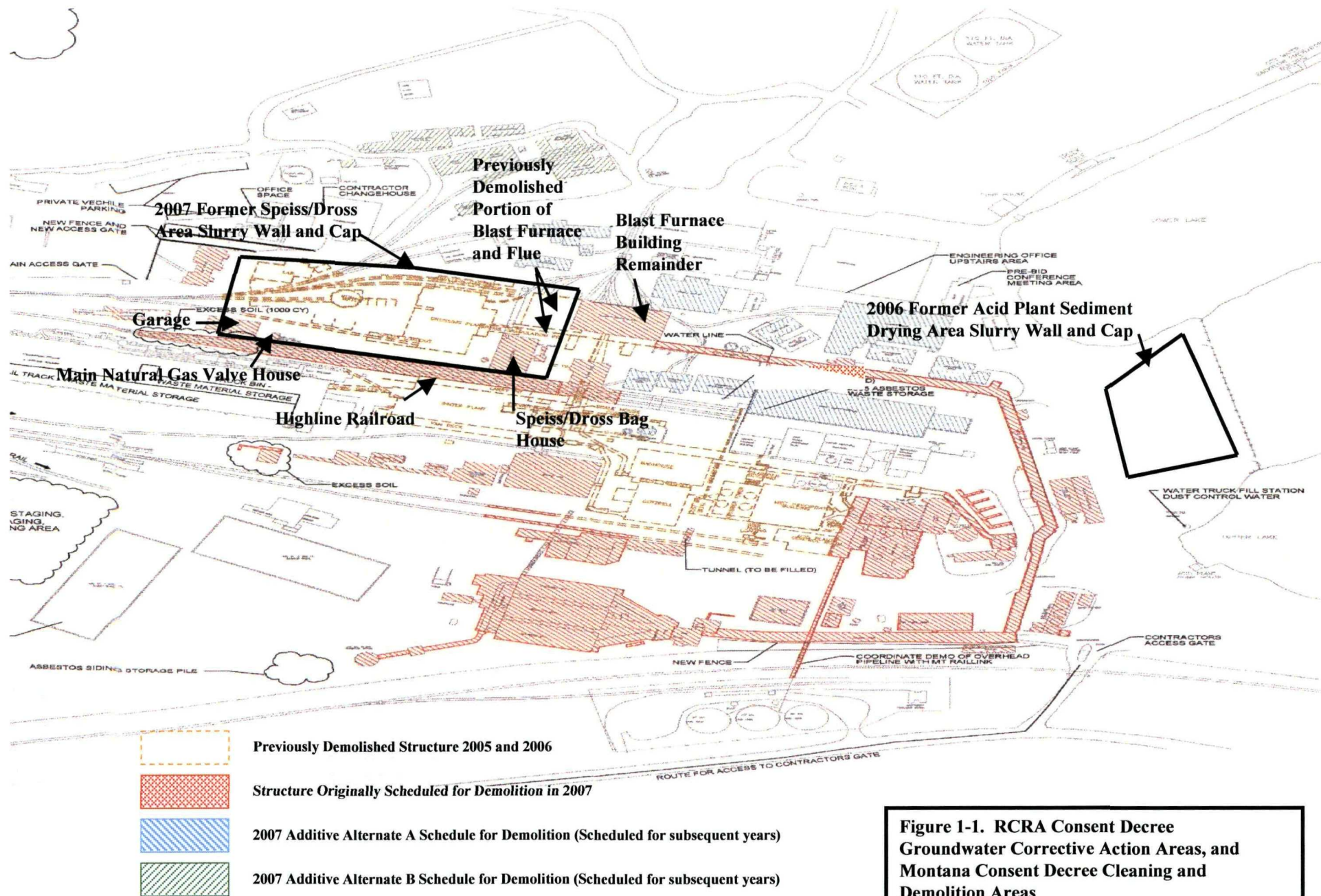


Figure 1-1. RCRA Consent Decree Groundwater Corrective Action Areas, and Montana Consent Decree Cleaning and Demolition Areas

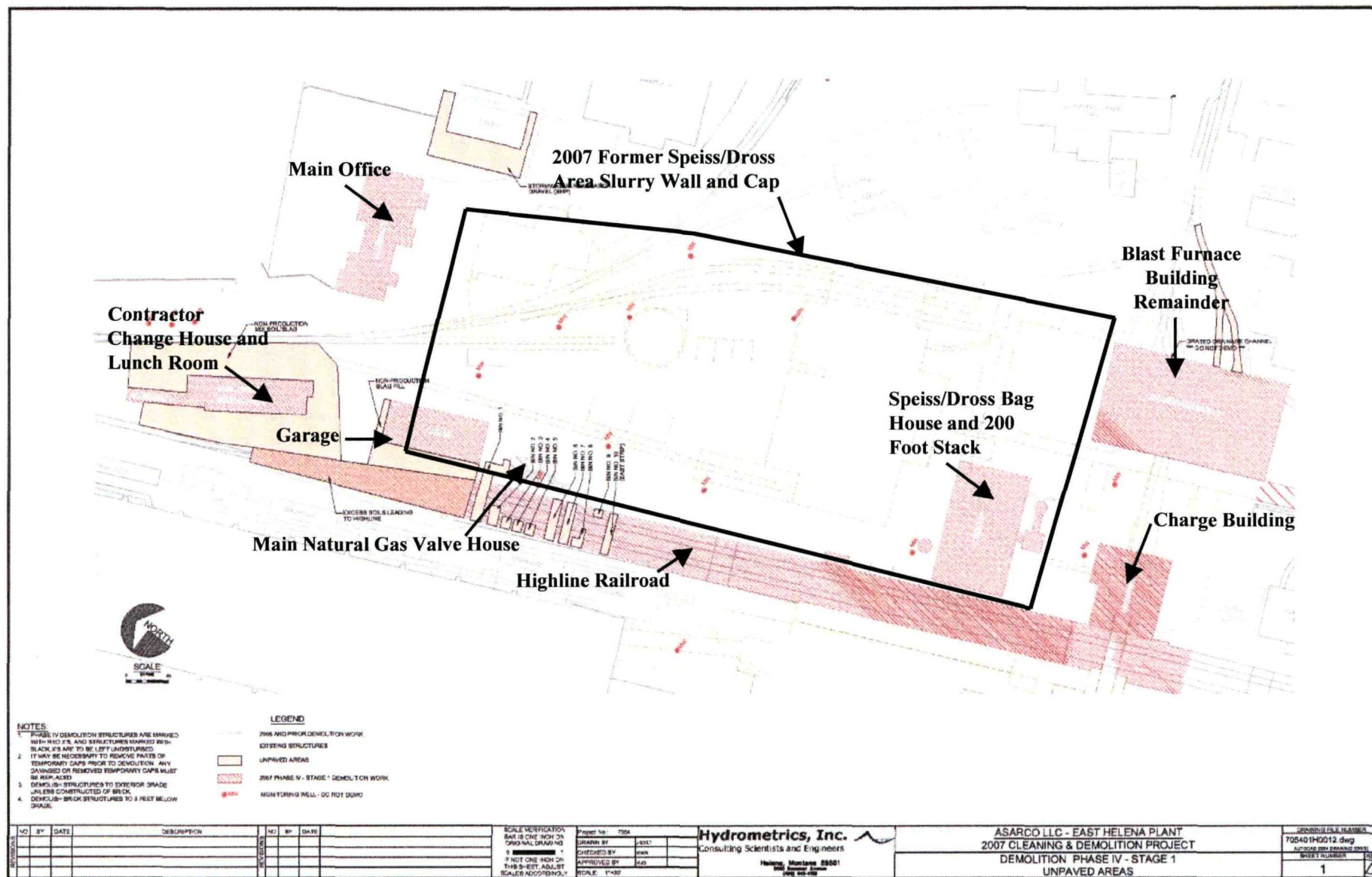


Figure 1-2. Speiss-Dross Area Slurry Wall Cleaning and Demolition Areas

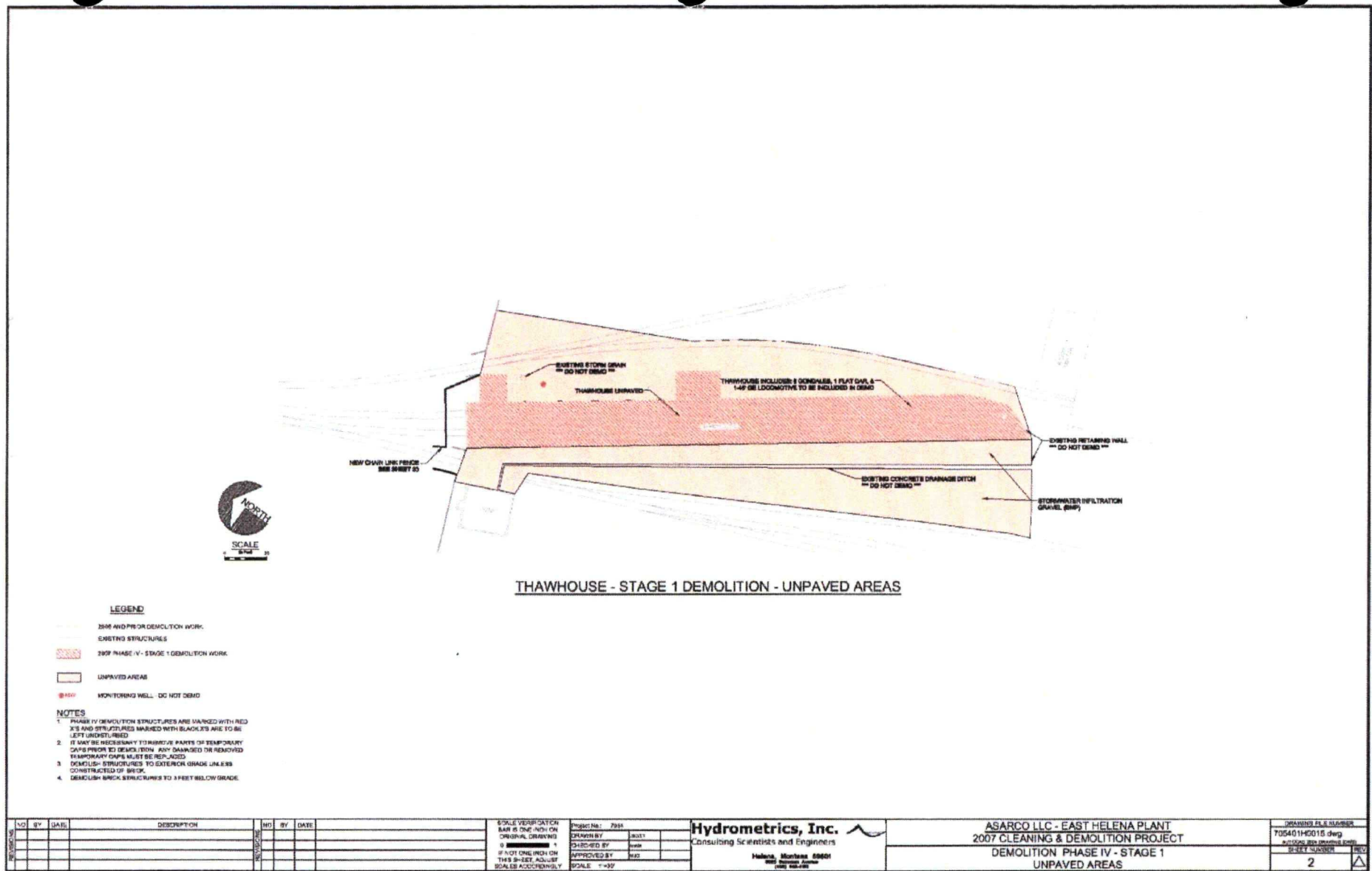


Figure 1-3. Thaw House Area, 2007 RCRA Consent Decree Groundwater Corrective Action Area and 2007 Montana Consent Decree Cleaning and Demolition Area

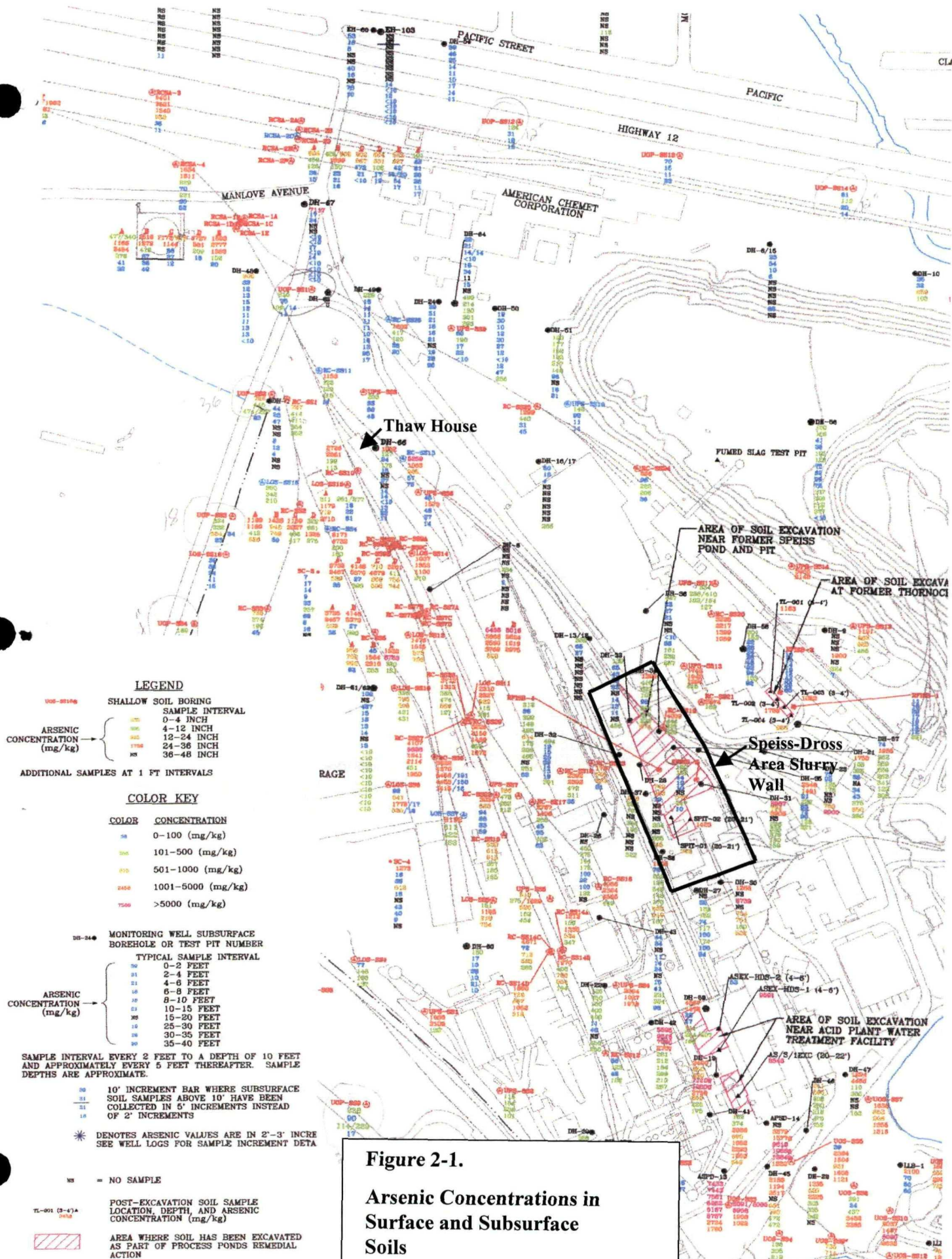


Figure 2-1.
Arsenic Concentrations in Surface and Subsurface Soils

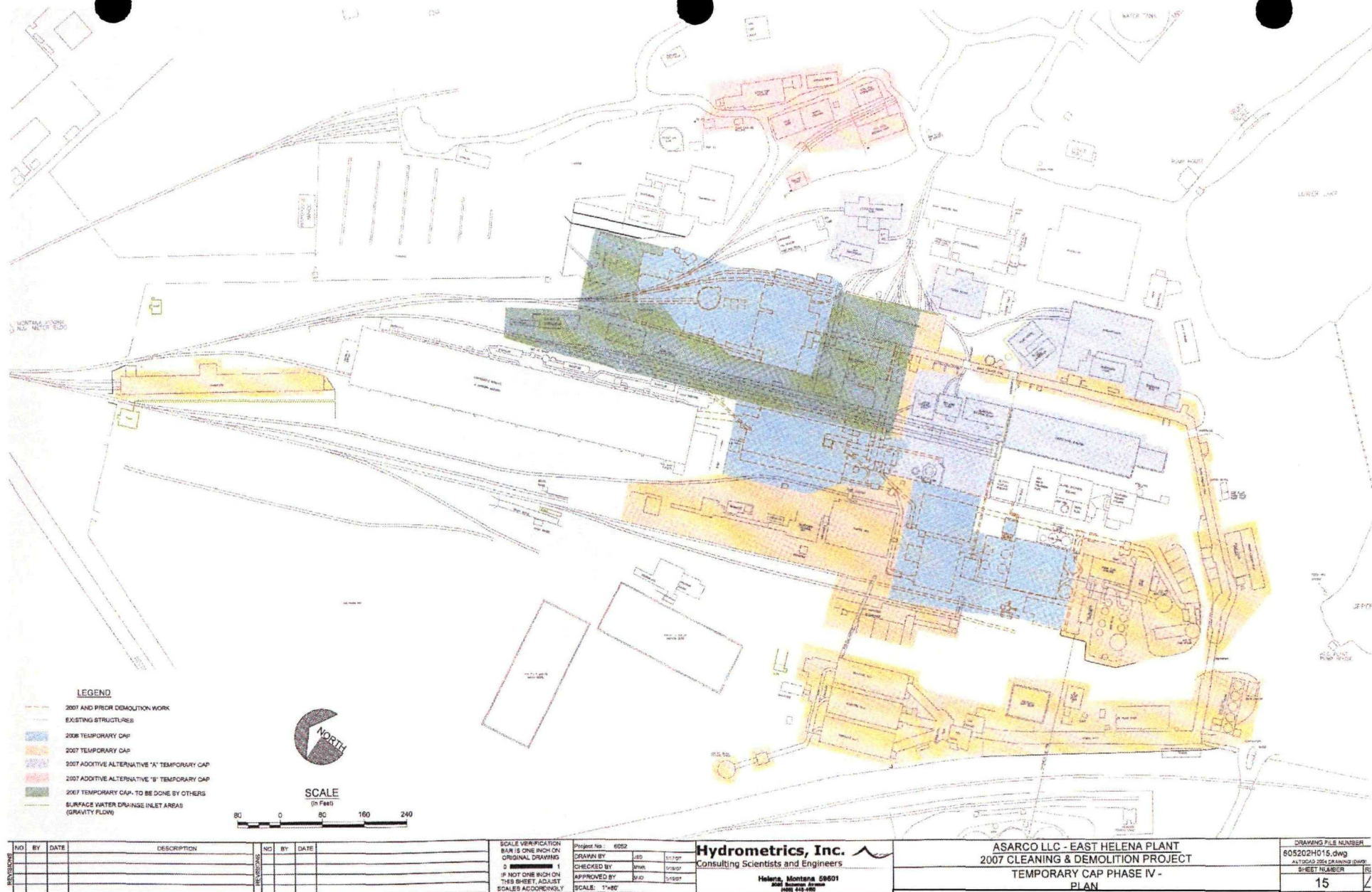


Figure 2-2. Temporary Cap Plan for Comprehensive Cleaning and Demolition

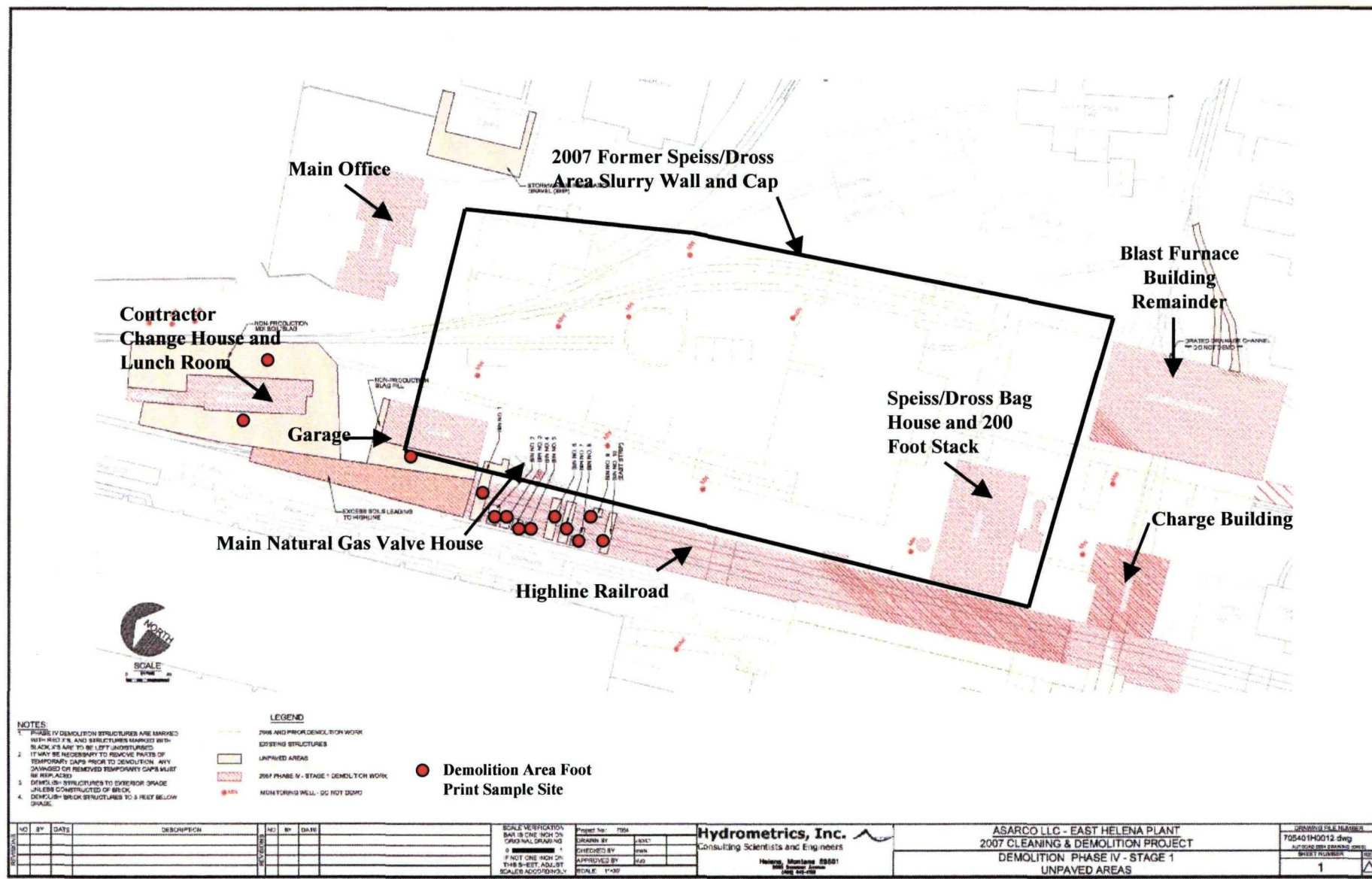
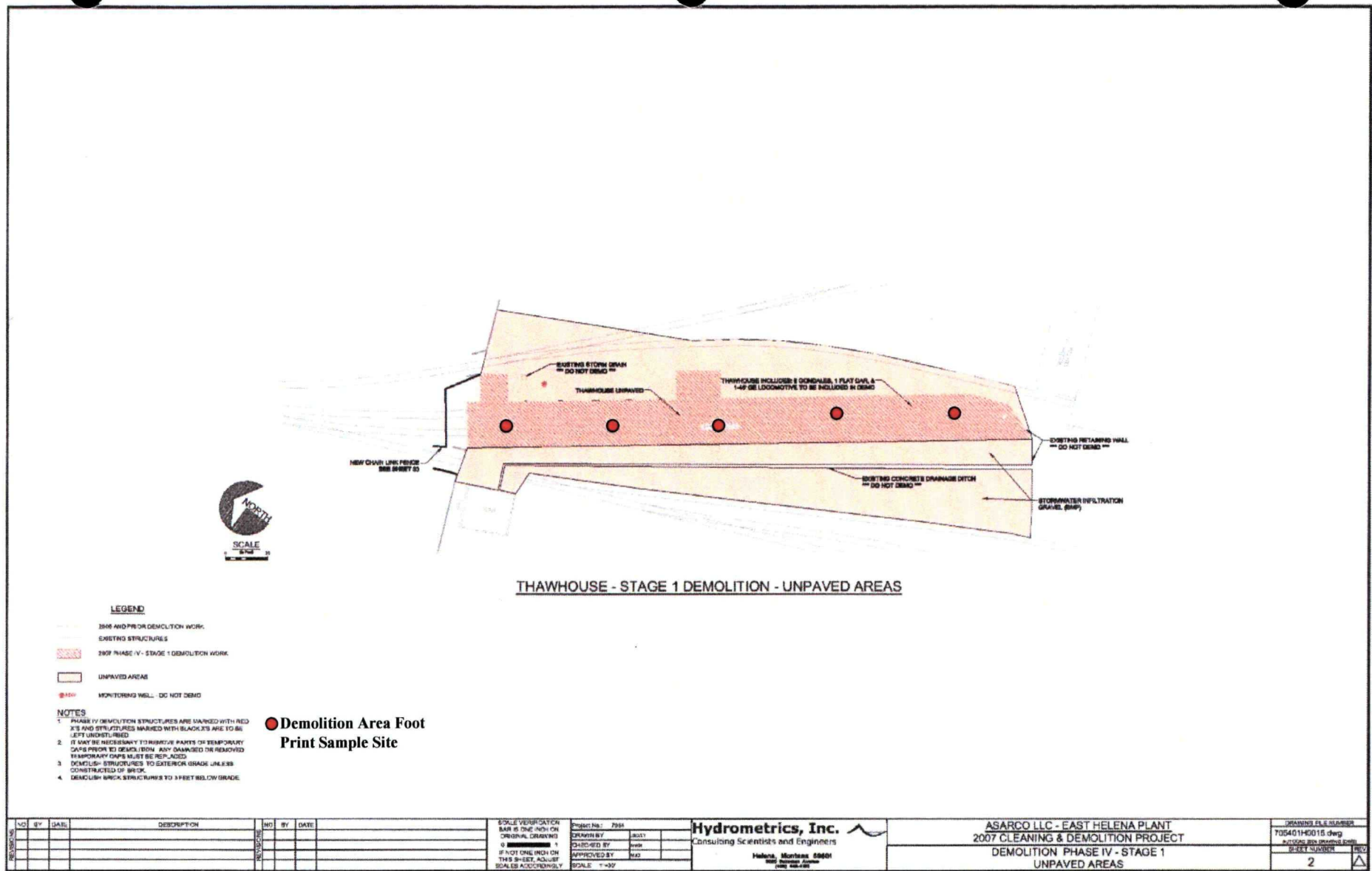


Figure 2-3. Speiss-Dross Area Demolition Foot Print Exposed Soil Sampling Sites



**Figure 2-4. Thaw House Area
Demolition Foot Print Exposed Soil
Sampling Sites**

FIGURE 3-1. 2007 CLEANING, DEMOLITION, AND SAMPLING WORK PLAN SCHEDULE



Project: f07 Demolition Fig 3-1
Date: Wed 9/12/07

Task



Milestone



External Tasks



Split



Summary



External Milestone



Progress



Project Summary



Deadline



APPENDIX A

**SURFACE AND SUBSURFACE SOIL SAMPLE DATA
FOR LOCATIONS NEAR OR ADJACENT TO
THE SPEISS-DROSS AND THAWHOUSE AREAS**

ASARCO EAST HELENA RFI SOIL SAMPLING

SITE: UPS-SS06

Date	Time	Sample Code	Depth Interval	Description	Concentrations				
					As	Cd	Cu	Pb	Zn
03/20/01	1300	UPS-SS06-1	0-5"	Brown sand and gravel; few fines; sand is fine to coarse (mostly coarse); moist.	45	92	179	630	350
	1305	UPS-SS06-2	5-18"	Black coarse sand with gravel; 10% fines; moist; some thin red clay zones in areas, 20% small gravel.	1879	701	3892	24682	18867
	1310	UPS-SS06-3	18-28"	Red crumbled brick layer; pieces range from fine sand to small gravel; dry.	48	28	154	694	605
	1315	UPS-SS06-4	28-35"	Black/white ash/porous red slag like material; varying sizes up to large gravels.	27	17	133	945	532
	1320	UPS-SS06-5	35-48"	Light brown sandy silt with <20% pea gravels (close to native soil texture).	14	<10	43	110	103

ASARCO EAST HELENA RFI SOIL SAMPLING

SITE: UPS-SS08

Date	Time	Sample Code	Depth Interval	Description	Concentrations				
					As	Cd	Cu	Pb	Zn
03/15/01	1215	UPS-SS08-1	0-4"	Dark brown to gray sand and gravel; road fill with minor clay.	203	80	787	2624	1347
	1220	UPS-SS08-2	4-12"	Dark brown sandy silt with >20% gravel; moist; gravels decreasing with depth.	83	48	259	1169	828
	1225	UPS-SS08-3	12-24"	Dark brown sandy silt with <20% gravel and intermittent; 1" thick clay lenses; dense; compacted; moist.	80	33	148	913	612
	1230	UPS-SS08-4	24-36"	Dark brown sandy silt with <20% gravel and intermittent; 1" thick clay lenses; dense; compacted; moist.	48	28	147	722	493

ASARCO EAST HELENA RFI SOIL SAMPLING

SITE: UPS-SS13

Date	Time	Sample Code	Depth Interval	Description	Concentrations				
					As	Cd	Cu	Pb	Zn
03/20/01	0900	UPS-SS13-1	0-4"	Gray to black road gravels and sand; 50% rounded coarse sand; 10% fines; moist.	1748	843	8221	14989	8045
	0905	UPS-SS13-2	4-12"	Same as above increasing moisture with depth fines approximately 10%; 30% gravels; 50% medium to coarse sand; gravels are more angular.	1924	501	7438	14334	9131
	0910	UPS-SS13-3	12-20"	Black to bright orange discolored slag; less dense and less heavy than typical plant slag (not porous, looks more like obsidian).	1894	312	7092	19676	13821
	0915	UPS-SS13-4	20-36"	Black to bright orange discolored slag; less dense and less heavy than typical plant slag (not porous, looks more like obsidian).	415	50	1695	9636	41455

ASARCO EAST HELENA RFI SOIL SAMPLING

SITE: LOS-SS14

Date	Time	Sample Code	Depth Interval	Description	Concentrations				
					As	Cd	Cu	Pb	Zn
03/15/01	1300	LOS-SS14-1	0-4"	Dark brown fine to coarse sand and gravel in a silty clay matrix; 50% sand and gravel, moist.	1007	277	1522	7975	4387
	1305	LOS-SS14-2	4-12"	Dark brown fine to coarse sand and gravel; minor silt and clay; 75% coarse sand; moist; intermittent cement brick pieces.	1353	441	1888	15362	6263
	1310	LOS-SS14-3	12-24"	Dark brown fine to coarse sand with gravel; gravel <20%; very few fines; sporadic cement chunks - gravel size.	1100	661	1213	12027	10971
	1315	LOS-SS14-4	24-36"	Same as above with more fines, 75% coarse, 25% silt/clay.	210	40	425	1760	1715

ASARCO EAST HELENA RFI SOIL SAMPLING

SITE: LOS-SS16

Date	Time	Sample Code	Depth Interval	Description	Concentrations				
					As	Cd	Cu	Pb	Zn
03/15/01	1045	LOS-SS16-1	0-4"	Black grading to brown sandy gravel road fill; moist.	311	109	1247	2675	7529
	1050	LOS-SS16-2	4-12"	Gray to brown large gravels with minor sand and intermittent lenses of clayey sand (sand is coarse grained); fill.	1179	628	2736	10217	15239
	1055	LOS-SS16-3	12-24"	Light brown clayey sandy silt with intermittent black coarse sand lenses; sand less abundant at depth; <10% gravel; moist; lenses of tan to light brown clay; moist; 2-4" thick.	719	356	762	3527	4796
	1100	LOS-SS16-4	24-36"	Light brown clayey sandy silt with intermittent black coarse sand lenses; sand less abundant at depth; <10% gravel; moist; lenses of tan to light brown clay; moist; 2-4" thick.	2710	564	1986	12936	9604

ASARCO EAST HELENA RFI SOIL SAMPLING

SITE: LOS-SS16A

Date	Time	Sample Code	Depth Interval	Description	Concentrations				
					As	Cd	Cu	Pb	Zn
05/14/01	0830	LOS-SS16A-1	0-2"	Brown, black, fine grain, 15% fine gravel, grading to brown clayey silt from 1.5 to 2.0.	276	208	797	3331	2668
	0840	LOS-SS16A-2	2-4"	Brown, very slightly clayey soft to semi firm; dry.	21	<10	40	114	96
	0850	LOS-SS16A-3	4-6"	Brown, soft to firm, nonplastic slightly moist, trace fine grain sand.	17	<10	47	127	123
	0900	LOS-SS16A-4	6-8"	As above.	15	<10	38	45	74
	0910	LOS-SS16A-5	8-10"	Brown, slightly clayey, soft trace fine gravel, dry to very slightly moist.	12	<10	23	26	55
	0920	LOS-SS16A-6	10-12"	Brown, soft to semi firm nonplastic, damp, driller started using water.	15	<10	22	17	57
	1030	LOS-SS16A-7	15-17"	Black, brown, fine to coarse sand, poorly sorted, fine to medium gravel, cobbles at 12 to 14'.	11	<10	18	17	42

ASARCO EAST HELENA RFI SOIL SAMPLING

SITE: LOS-SS16B

Date	Time	Sample Code	Depth Interval	Description	Concentrations				
					As	Cd	Cu	Pb	Zn
07/19/01	1500	LOS-SS16B-1	0-2'	0-1' - Dark brown, sandy gravelly silt; 10% sand and 10% gravels, fine to coarse grained, black slag pieces; firm; dry.	261	216	812	3361	3002
				1-2' - Light brown silt; <10% very fine sand; <5% gravels; dry; firm.					
	1515	LOS-SS16B-1D	0-2'	0-1' - Silt dark brown sandy gravelly silty; 10% sand and 10% gravels, fine to coarse grained, black slag pieces; firm; dry.	277	239	868	3569	3234
				1-2' - Light brown silt; <10% very fine sand; <5% gravels; dry; firm.					
	1530	LOS-SS16B-2	2-4'	Light brown, sandy silt/silty sand; very fine sand; varying degrees of sand vs. silt throughout sample; dry; firm. Increasing clay content with depth.	18	<10	23	47	88
	1600	LOS-SS16B-3	4-6'	Light brown, silty clay; firm; dry; dense.	22	<10	35	29	69
	1615	LOS-SS16B-4	10-12'	Same as above; however, moist. At 12' driving a basalt cobble, basalt cobble cuttings in spoon.	81	<10	24	25	66

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-11-6T	DH-11-7T	DH-11-7T	DH-13-1
SAMPLE DATE	12/21/1987	12/21/1987	12/21/1987	11/01/1986
LAB	TSC-SLC	VERSR	TSC-SLC	RMAL
LAB NUMBER	88-385		88-380	
REMARKS		SPLIT		SPLIT
DEPTH	3-4'	4-5'	4-5'	10-10.5'
SAMPLE NUMBER	HYD-8850	HYD-7931.A14	HYD-8851	HYD-7933.A14
-- PHYSICAL PARAMETERS --				
PH	8.5		8.3	
-- MAJOR CONSTITUENTS --				
MAGNESIUM (MG) DIS		2010.0		
SODIUM (NA) DIS		103.0		
POTASSIUM (K) DIS		880.0		
-- METALS & MINOR CONSTITUENTS --				
ARSENIC (AS) TOT	22.0		6.0	
CADMIUM (CD) TOT	4.3		<0.5	
COPPER (CU) TOT	46.0	16.0	17.0	122.0
IRON (FE) TOT	9968.0	10200.0	11073.0	29500.0
LEAD (PB) TOT	324.0	23.0	18.0	250.0
MANGANESE (MN) TOT	625.0	253.0	216.0	615.0
MERCURY (HG) TOT		0.1		
NICKEL (NI) TOT		5.4		
ZINC (ZN) TOT	420.0		33.0	
-- OTHER PARAMETERS --				
COARSE FRAGMENTS (%)	60.9		64.78	

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-13-1T	DH-13-1T	DH-13-2	DH-13-2T
SAMPLE DATE	12/22/1987	12/22/1987	11/01/1986	12/22/1987
LAB	VERSR	TSC-SLC	RMAL	TSC-SLC
LAB NUMBER		88-326		88-322
REMARKS	SPLIT		SPLIT	
DEPTH	0-0.3'	0-0.3'	15-15.5'	0.3-1'
SAMPLE NUMBER	HYD-7943.A14	HYD-8858	HYD-7934.A14	HYD-8859

-- PHYSICAL PARAMETERS --

PH	6.7	6.8
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-- MAJOR CONSTITUENTS --

MAGNESIUM (MG) DIS	3610.0
SODIUM (NA) DIS	2970.0
POTASSIUM (K) DIS	2950.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	3163.0	389.0
CADMIUM (CD) TOT	1610.0	84.0
COPPER (CU) TOT	17100.0	43.0
IRON (FE) TOT	86600.0	15200.0
LEAD (PB) TOT	33400.0	20.0
MANGANESE (MN) TOT	2070.0	407.0
MERCURY (HG) TOT	22.0	
NICKEL (NI) TOT	191.0	
ZINC (ZN) TOT	14450.0	5868.0

-- OTHER PARAMETERS --

COARSE FRAGMENTS (%)	29.71	40.34
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NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved, TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-13-3	DH-13-3T	DH-13-3T	DH-13-3T	DH-13-3T
SAMPLE DATE	11/01/1986	12/22/1987	12/22/1987	12/22/1987	12/23/1987
LAB	RMAL	VERSR	TSC-SLC	TSC-SLC	VERSR
LAB NUMBER			88-330	88-325	
REMARKS	SPLIT	SPLIT	DUPLICATE		SPLIT-DUP
DEPTH	20-21.5'	1-2'	1-2'	1-2'	1-2'
SAMPLE NUMBER	HYD-7935.A14	HYD-7946.A14	HYD-7952	HYD-8860	HYD-7953.A14

-- PHYSICAL PARAMETERS --

PH		6.7	6.9	
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-- MAJOR CONSTITUENTS --

MAGNESIUM (MG) DIS		3170.0		2630.0
SODIUM (NA) DIS		3120.0		2480.0
POTASSIUM (K) DIS		1670.0		1340.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT			28.0	28.0	*
CADMIUM (CD) TOT			2.2	2.1	
COPPER (CU) TOT	58.0	86.0	91.0	88.0	184.0
IRON (FE) TOT	16000.0	24400.0	20690.0	22770.0	18500.0
LEAD (PB) TOT	31.0	213.0	127.0	209.0	233.0
MANGANESE (MN) TOT	712.0	73.0	54.0	66.0	70.0
MERCURY (HG) TOT		0.11			0.11
NICKEL (NI) TOT		30.0			25.0
ZINC (ZN) TOT			126.0	112.0	

-- OTHER PARAMETERS --

COARSE FRAGMENTS (%)		73.77	65.67	
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NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-13-4	DH-13-4	DH-13-4	DH-13-4	DH-13-4	DH-13-4
SAMPLE DATE	11/01/1986	11/01/1986	11/01/1986	11/01/1986	11/01/1986	11/01/1986
LAB	LKS	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	1156	87-2472	87-2473	87-2474	87-2475	87-2476
REMARKS		WATER AMMONIUM ACETAT	HYDROXYLACHLORI	HYDROGEN PEROXI	HYDRAZINE CHLOR	
TYPE		SEQ EX	SEQ EX	SEQ EX	SEQ EX	SEQ EX
DEPTH	25-25.5	25-25.5'	25-25.5'	25-25.5'	25-25.5'	25-25.5'
SAMPLE NUMBER	HYD-7550	HYD-7669	HYD-7671	HYD-7673	HYD-7675	HYD-7677

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	0.3	1.6	1.9	2.2	8.4
CADMIUM (CD) DIS	0.09	0.1	0.03	0.04	0.01
COPPER (CU) DIS	<0.05	0.18	0.06	1.52	<0.05
IRON (FE) DIS	0.23	9.2	15.6	2.7	82.0
LEAD (PB) DIS	<0.1	0.96	0.42	0.15	0.15
MANGANESE (MN) DIS	32.5	12.0	0.95	0.68	0.62
ZINC (ZN) DIS	8.6	6.8	1.2	2.6	2.5

-- HYDROCARBONS & ORGANICS --

OIL & GREASE	350.0
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NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-13-4	DH-13-4	DH-13-4	DH-13-5	DH-13-5
SAMPLE DATE	11/01/1986	11/01/1986	11/01/1986	11/02/1986	11/02/1986
LAB	TSC-SLC	RMAL	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	87-2477			87-2478	87-2479
REMARKS	RESIDUE	SPLIT		WATER	AMMONIUM ACETAT
TYPE	SEQ EX			SEQ EX	SEQ EX
DEPTH	25-25.5'	25-25.5'	25-25.5'	30-31.5'	30-31.5'
SAMPLE NUMBER	HYD-7678	HYD-7936.A14	HYD-8852.A16	HYD-7679	HYD-7681

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	29.0			0.44	0.72
ARSENIC (AS) TOT			1434.0		
CADMIUM (CD) DIS	<0.01			4.55	17.0
CADMIUM (CD) TOT			10.15		
COPPER (CU) DIS	3.4			<0.05	0.23
COPPER (CU) TOT		40.0	200.0		
IRON (FE) DIS	1400.0			<0.1	3.3
IRON (FE) TOT		18200.0	40478.0		
LEAD (PB) DIS	1.42			<0.1	0.4
LEAD (PB) TOT		47.0	119.5		
MANGANESE (MN) DIS	11.0			0.84	2.4
MANGANESE (MN) TOT		890.0	1394.0		
ZINC (ZN) DIS	9.8			1.7	8.3
ZINC (ZN) TOT			1013.0		

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT: Total; DIS: Dissolved; TRC: Total Recoverable; E: Estimated; <: Less Than Detect. Blank: parameter not tested
 Validation Flags: A: Anomalous; UJ1: Blank; J2, UJ2: Standard; J3: Hold Time; J4, UJ4: Duplicate, Spike, or Split Exceedance;
 R: Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-13-5	DH-13-5	DH-13-5	DH-13-5	DH-13-5	DH-13-5
SAMPLE DATE	11/02/1986	11/02/1986	11/02/1986	11/02/1986	11/02/1986	11/02/1986
LAB	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC	RMAL	TSC-SLC
LAB NUMBER	87-2480	87-2481	87-2482	87-2483		
REMARKS	HYDROXYLACHLORI	HYDROGEN PEROXI	HYDRAZINE CHLOR	RESIDUE	SPLIT	
TYPE	SEQ EX	SEQ EX	SEQ EX	SEQ EX		
DEPTH	30-31.5'	30-31.5'	30-31.5'	30-31.5'	30-31.5'	30-31.5'
SAMPLE NUMBER	HYD-7683	HYD-7685	HYD-7687	HYD-7688	HYD-7939.A14	HYD-8853.A16

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	1.2	0.66	0.9	4.8		
ARSENIC (AS) TOT						299.5
CADMIUM (CD) DIS	0.66	3.55	0.26	0.46		
CADMIUM (CD) TOT						1142.0
COPPER (CU) DIS	0.06	6.5	<0.05	4.0		
COPPER (CU) TOT					554.0	439.5
IRON (FE) DIS	4.7	0.55	65.0	1625.0		
IRON (FE) TOT					10000.0	44303.0
LEAD (PB) DIS	0.12	0.11	0.15	0.86		
LEAD (PB) TOT					15.0	60.5
MANGANESE (MN) DIS	0.36	0.07	0.3	11.5		
MANGANESE (MN) TOT					124.0	454.5
ZINC (ZN) DIS	1.4	3.4	3.1	16.2		
ZINC (ZN) TOT						1236.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-13-5T	DH-13-6	DH-13-6	DH-13-6	DH-13-6
SAMPLE DATE	12/22/1987	11/02/1986	11/02/1986	11/02/1986	11/02/1986
LAB	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	88-329	87-2484	87-2485	87-2486	87-2487
REMARKS		WATER AMMONIUM ACETAT HYDROXYLACHLORI HYDROGEN PEROXI			
TYPE		SEQ EX	SEQ EX	SEQ EX	SEQ EX
DEPTH	2-3'	35-36'	35-36'	35-36'	35-36'
SAMPLE NUMBER	HYD-8855	HYD-7689	HYD-7691	HYD-7693	HYD-7695

-- PHYSICAL PARAMETERS --

PH	6.9
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-- METALS & MINOR CONSTITUENTS --

		1.2	2.8	2.1	1.9
ARSENIC (AS) DIS					
ARSENIC (AS) TOT	65.0				
CADMIUM (CD) DIS		0.14	2.45	1.2	100.0
CADMIUM (CD) TOT	3.0				
COPPER (CU) DIS		<0.05	<0.05	<0.05	0.55
COPPER (CU) TOT	75.0				
IRON (FE) DIS		0.18	1.7	3.3	0.4
IRON (FE) TOT	15490.0				
LEAD (PB) DIS		<0.1	0.11	<0.1	<0.1
LEAD (PB) TOT	273.0				
MANGANESE (MN) DIS		0.08	2.15	0.07	0.11
MANGANESE (MN) TOT	166.0				
ZINC (ZN) DIS		0.35	13.8	2.0	47.5
ZINC (ZN) TOT	111.0				

-- OTHER PARAMETERS --

COARSE FRAGMENTS (%)	48.11
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NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-13-6	DH-13-6	DH-13-6	DH-13-6	DH-13-6T
SAMPLE DATE	11/02/1986	11/02/1986	11/02/1986	11/02/1986	12/22/1987
LAB	TSC-SLC	TSC-SLC	RMAL	TSC-SLC	TSC-SLC
LAB NUMBER	87-2488	87-2489			88-328
REMARKS	HYDRAZINE CHLOR	RESIDUE	SPLIT		
TYPE	SEQ EX	SEQ EX			
DEPTH	35-36'	35-36'	35-36'	35-36'	3-4'
SAMPLE NUMBER	HYD-7697	HYD-7698	HYD-7940.A14	HYD-8854.A16	HYD-8856

-- PHYSICAL PARAMETERS --

PH	7.6
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-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) DIS	5.3	26.0			
ARSENIC (AS) TOT				1270.0	32.0
CADMIUM (CD) DIS	0.09	5.65			
CADMIUM (CD) TOT				5330.0	1.4
COPPER (CU) DIS	<0.05	4.1			
COPPER (CU) TOT			71.0	130.0	25.0
IRON (FE) DIS	190.0	2150.0			
IRON (FE) TOT			31700.0	63522.0	12548.0
LEAD (PB) DIS	0.12	1.06			
LEAD (PB) TOT			12.0	43.0	63.0
MANGANESE (MN) DIS	3.3	18.0			
MANGANESE (MN) TOT			402.0	732.5	222.0
ZINC (ZN) DIS	5.5	22.5			
ZINC (ZN) TOT				3957.0	52.0

-- OTHER PARAMETERS --

COARSE FRAGMENTS (%)	41.31
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NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-13-7	DH-13-7T	DH-13-7T	DH-13-8
SAMPLE DATE	11/03/1986	12/22/1987	12/22/1987	11/03/1986
LAB	RMAL	VERSR	TSC-SLC	RMAL
LAB NUMBER			88-333	
REMARKS	SPLIT	SPLIT		SPLIT
DEPTH	40-41'	4-5'	4-5'	45-46.5'
SAMPLE NUMBER	HYD-7941.A14	HYD-7951.A14	HYD-8857	HYD-7942.A14

-- PHYSICAL PARAMETERS --

PH	8.0
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-- MAJOR CONSTITUENTS --

MAGNESIUM (MG) DIS	6450.0
SODIUM (NA) DIS	330.0
POTASSIUM (K) DIS	2110.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	27.0
CADMIUM (CD) TOT	0.6
COPPER (CU) TOT	25.0
IRON (FE) TOT	14700.0
LEAD (PB) TOT	16.0
MANGANESE (MN) TOT	166.0
MERCURY (HG) TOT	0.11
NICKEL (NI) TOT	9.4
ZINC (ZN) TOT	42.0

-- OTHER PARAMETERS --

COARSE FRAGMENTS (%)	46.62
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NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-24-11	DH-26-0	DH-26-1
SAMPLE DATE	04/30/1987	04/28/1987	04/26/1987
LAB	VERSR	LKS	TSC-SLC
LAB NUMBER		4532	87-4442
REMARKS	SPLIT-DUPLICATE		
DEPTH	35-36'		2-3.5'
SAMPLE NUMBER	HYD-8066.A14	HYD-7549	HYD-8068

-- MAJOR CONSTITUENTS --

MAGNESIUM (MG) DIS	8250.0
SODIUM (NA) DIS	329.0
POTASSIUM (K) DIS	5370.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT		450.0
CADMIUM (CD) TOT		60.0
COPPER (CU) TOT	66.0	350.0
IRON (FE) TOT	27200.0	25500.0
LEAD (PB) TOT	44.0	3600.0
MANGANESE (MN) TOT	1300.0	520.0
MERCURY (HG) TOT	0.11	
NICKEL (NI) TOT	17.0	
ZINC (ZN) TOT		1300.0

-- VOLATILE ORGANICS --

1,1,1-TRICHLOROETHANE	<0.003
1,1,2,2-TETRACHLOROETHANE	<0.003
1,1,2-TRICHLOROETHANE	<0.003
1,1-DICHLOROETHANE	<0.003
1,1-DICHLOROETHENE	<0.003
1,2-DICHLOROETHANE	<0.003
1,2-DICHLOROPROPANE	<0.003
2-BUTANONE (METHYL-ETHYL-KETONE)	<0.003
2-CHLOROETHYL VINYL ETHER	<0.003
2-HEXANONE	<0.003
4-METHYL-2-PENTANONE	<0.003
ACETONE	<0.003
ACROLEIN	<0.015
ACRYLONITRILE	<0.015
BENZENE	<0.003
BROMODICHLOROMETHANE	<0.003
BROMOFORM	<0.003
BROMOMETHANE	<0.003
CARBON DISULFIDE	<0.003
CARBON TETRACHLORIDE	<0.003
CHLOROBENZENE	<0.003
CHLOROETHANE	<0.003
CHLOROFORM	<0.003
CHLOROMETHANE	<0.003
CIS-1,3-DICHLOROPROPENE	<0.003
ETHYLBENZENE	<0.003
TOTAL XYLENE TOT	<0.003
STYRENE	<0.003
TETRACHLOROETHENE	<0.003
TOLUENE	<0.003
TRANS-1,2-DICHLOROETHENE	<0.003
TRANS-1,3-DICHLOROPROPENE	<0.003
TRICHLOROETHENE	<0.003
VINYL ACETATE	<0.003

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-24-11	DH-26-0	DH-26-1
SAMPLE DATE	04/30/1987	04/28/1987	04/26/1987
LAB	VRSR	LKS	TSC-SLC
LAB NUMBER		4532	87-4442
REMARKS	SPLIT-DUPLICATE		
DEPTH	35-36'		2-3.5'
SAMPLE NUMBER	HYD-8066.A14	HYD-7549	HYD-8068

-- VOLATILE ORGANICS --

VINYL CHLORIDE

<0.003

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-26-2	DH-26-3	DH-26-3	DH-26-4
SAMPLE DATE	04/28/1987	04/28/1987	04/28/1987	04/28/1987
LAB	TSC-SLC	TSC-SLC	VERSR	TSC-SLC
LAB NUMBER	87-4445	87-4447		87-4444
REMARKS			SPLIT	
DEPTH	4-5.5'	6-7'	6-7'	8-9.5'
SAMPLE NUMBER	HYD-8069	HYD-8070	HYD-8075.A14	HYD-8071

-- MAJOR CONSTITUENTS --

MAGNESIUM (MG) DIS	4680.0
SODIUM (NA) DIS	614.0
POTASSIUM (K) DIS	1200.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	275.0	164.0		172.0
CADMIUM (CD) TOT	1.5	2.5		1.0
COPPER (CU) TOT	14.0	28.0	40.0	30.0
IRON (FE) TOT	9000.0	23000.0	12200.0	19000.0
LEAD (PB) TOT	23.0	105.0	73.0	21.0
MANGANESE (MN) TOT	160.0	250.0	247.0	245.0
MERCURY (HG) TOT			0.23	
NICKEL (NI) TOT			8.4	
ZINC (ZN) TOT	38.0	100.0		43.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-26-5	DH-26-6	DH-26-7	DH-26-7
SAMPLE DATE	04/28/1987	04/28/1987	04/28/1987	04/28/1987
LAB	TSC-SLC	TSC-SLC	TSC-SLC	VERSR
LAB NUMBER	87-4443	87-4446	87-4448	
REMARKS				SPLIT
DEPTH	10-11.5'	15-16'	20-21.5'	20-21.5'
SAMPLE NUMBER	HYD-8072	HYD-8073	HYD-8074	HYD-8076.A14

-- MAJOR CONSTITUENTS --

MAGNESIUM (MG) DIS	2830.0
SODIUM (NA) DIS	317.0
POTASSIUM (K) DIS	1820.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	100.0	92.0	100.0	
CADMIUM (CD) TOT	2.5	1.0	1.5	
COPPER (CU) TOT	48.0	65.0	90.0	62.0
IRON (FE) TOT	28000.0	25500.0	21000.0	17200.0
LEAD (PB) TOT	91.0	23.0	42.0	25.0
MANGANESE (MN) TOT	360.0	330.0	1100.0	608.0
MERCURY (HG) TOT				0.1
NICKEL (NI) TOT				9.5
ZINC (ZN) TOT	100.0	62.0	81.0	

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-26-8	DH-26-8	DH-27-1	DH-27-2
SAMPLE DATE	04/29/1987	04/29/1987	05/01/1987	05/01/1987
LAB	LKS	TSC-SLC	TSC-SLC	TSC-SLC
LAB NUMBER	4532	87-4441	87-4460	87-4461
DEPTH	25-26'	25-26'	2-3.5'	4-5.5'
SAMPLE NUMBER	HYD-7553	HYD-8077	HYD-8078	HYD-8079

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	122.0	32.0	132.0
CADMIUM (CD) TOT	5.0	0.75	1.5
COPPER (CU) TOT	74.0	63.0	76.0
IRON (FE) TOT	28500.0	28000.0	28500.0
LEAD (PB) TOT	440.0	9.0	22750.0
MANGANESE (MN) TOT	650.0	455.0	1800.0
ZINC (ZN) TOT	425.0	140.0	105.0

-- VOLATILE ORGANICS --

BENZENE	<0.01
CHLOROBENZENE	<0.01
ETHYLBENZENE	<0.01
M-P XYLENE	<0.01
O-XYLENE	<0.01
TOLUENE	<0.01

-- SEMI-VOLATILE EXTRACTABLES --

1,2-DICHLOROBENZENE	<0.01
1,3-DICHLOROBENZENE	<0.01
1,4-DICHLOROBENZENE	<0.01

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-27-3	DH-27-3	DH-27-3	DH-27-4
SAMPLE DATE	05/01/1987	05/01/1987	05/01/1987	05/01/1987
LAB	TSC-SLC	VERSR	VERSR	TSC-SLC
LAB NUMBER	87-4462			87-4463
REMARKS		SPLIT	SPLIT-DUPLICATE	
DEPTH	6-7.5'	6-7.5'	6-7.5'	8-9.5'
SAMPLE NUMBER	HYD-8080	HYD-8087.A14	HYD-8088.A14	HYD-8081

-- MAJOR CONSTITUENTS --

MAGNESIUM (MG) DIS	1360.0	1390.0
SODIUM (NA) DIS	322.0	339.0
POTASSIUM (K) DIS	1470.0	953.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	162.0			74.0
CADMIUM (CD) TOT	2.0			1.0
COPPER (CU) TOT	35.0	45.0	42.0	77.0
IRON (FE) TOT	15500.0	23700.0	15600.0	21500.0
LEAD (PB) TOT	7.0	23.0	21.0	34.0
MANGANESE (MN) TOT	135.0	189.0	214.0	950.0
MERCURY (HG) TOT		0.1	0.1	
NICKEL (NI) TOT		6.4	6.3	
ZINC (ZN) TOT	38.0			72.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-27-5	DH-27-6	DH-27-6	DH-27-7
SAMPLE DATE	05/01/1987	05/01/1987	05/01/1987	05/01/1987
LAB	TSC-SLC	LKS	TSC-SLC	TSC-SLC
LAB NUMBER	87-4464	4532	87-4465	87-4466
DEPTH	10-11.5'	15-16'	15-16'	20-21'
SAMPLE NUMBER	HYD-8082	HYD-7554	HYD-8083	HYD-8084

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	117.0	100.0	174.0
CADMIUM (CD) TOT	1.5	8.5	4.5
COPPER (CU) TOT	66.0	100.0	54.0
IRON (FE) TOT	40000.0	30500.0	26000.0
LEAD (PB) TOT	32.0	62.0	16.0
MANGANESE (MN) TOT	950.0	1600.0	185.0
ZINC (ZN) TOT	130.0	390.0	1500.0

-- SEMI-VOLATILE EXTRACTABLES --

1,2,4-TRICHLOROBENZENE	<0.056
1,2-DICHLOROBENZENE	<0.056
1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	<0.056
1,3-DICHLOROBENZENE	<0.056
1,4-DICHLOROBENZENE	<0.056
2,4,5-TRICHLOROPHENOL	<0.056
2,4,6-TRICHLOROPHENOL	<0.056
2,4-DICHLOROPHENOL	<0.056
2,4-DIMETHYLPHENOL	<0.056
2,4-DINITROPHENOL	<0.056
2,4-DINITROTOLUENE	<0.056
2,6-DINITROTOLUENE	<0.056
2-CHLORONAPHTHALENE	<0.056
2-CHLOROPHENOL	<0.056
2-METHYLNAPHTHALENE	<0.056
2-METHYLPHENOL (O-CRESOL)	<0.056
2-NITROANILINE	<0.056
2-NITROPHENOL	<0.056
3,3'-DICHLOROBENZIDINE	<0.056
3-NITROANILINE	<0.056
4,6-DINITRO-O-CRESOL	<0.056
4-BROMOPHENYL PHENYL ETHER	<0.056
4-CHLORO-M-CRESOL	<0.056
4-CHLOROANILINE	<0.056
4-CHLOROPHENYL PHENYL ETHER	<0.056
4-METHYLPHENOL (P-CRESOL)	<0.056
4-NITROANILINE	<0.056
4-NITROPHENOL	<0.056
ACENAPHTHENE	<0.056
ACENAPHTHYLENE	<0.056
ANILINE	<0.056
ANTHRACENE	<0.056
BENZIDINE	<0.056
BENZO (A) ANTHRACENE	<0.056
BENZO (A) PYRENE	<0.056
BENZO (B) FLUORANTHENE	<0.056
BENZO (GHI) PERYLENE	<0.056
BENZO (K) FLUORANTHENE	<0.056
BENZOIC ACID	<0.056
BENZYL ALCOHOL	<0.056
BIS (2-CHLOROETHOXY) METHANE	<0.056
BIS (2-CHLOROETHYL) ETHER	<0.056

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J1,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-27-5	DH-27-6	DH-27-6	DH-27-7
SAMPLE DATE	05/01/1987	05/01/1987	05/01/1987	05/01/1987
LAB	TSC-SLC	LKS	TSC-SLC	TSC-SLC
LAB NUMBER	87-4464	4532	87-4465	87-4466
DEPTH	10-11.5'	15-16'	15-16'	20-21'
SAMPLE NUMBER	HYD-8082	HYD-7554	HYD-8083	HYD-8084

-- SEMI-VOLATILE EXTRACTABLES --

BIS (2-CHLOROISOPROPYL) ETHER	<0.056
BIS (2-ETHYLHEXYL) PHTHALATE	0.33
BUTYL BENZYL PHTHALATE	<0.056
CHRYSENE	<0.056
DI-N-OCTYLPHTHALATE	<0.056
DIBENZ (A,H) ANTHRACENE	<0.056
DIBENZOFURAN	<0.056
DIBUTYLPHTHALATE	<0.056
DIETHYLPHTHALATE	<0.056
DIMETHYLPHTHALATE	<0.056
FLUORANTHENE	<0.056
FLUORENE	<0.056
HEXACHLORO BENZENE	<0.056
HEXACHLOROBUTADIENE	<0.056
HEXACHLOROCYCLOPENTADIENE	<0.056
HEXACHLOROETHANE	<0.056
INDENO (1,2,3-CD) PYRENE	<0.056
ISOPHORONE	<0.056
N-NITROSO-DI-N-PROPYLAMINE	<0.056
N-NITROSODIMETHYLAMINE	<0.056
N-NITROSODIPHENYLAMINE	<0.056
NAPHTHALENE	<0.056
NITROBENZENE	<0.056
PENTACHLOROPHENOL	<0.056
PHENANTHRENE	0.49
PHENOL	<0.056
PYRENE	<0.056

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT: Total; DIS: Dissolved; TRC: Total Recoverable; E: Estimated; <: Less Than Detect. Blank: parameter not tested
 Validation Flags: A: Anomalous; UJ1: Blank; J2, UJ2: Standard; J3: Hold Time; J4, UJ4: Duplicate, Spike, or Split Exceedance;
 R: Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-27-7	DH-27-8	DH-27-9
SAMPLE DATE	05/31/1987	05/01/1987	05/01/1987
LAB	VERSR	TSC-SLC	TSC-SLC
LAB NUMBER		87-4467	87-4468
REMARKS	SPLIT		
DEPTH	20-21'	25-26.5'	30-31.5'
SAMPLE NUMBER	HYD-8089.A14	HYD-8085	HYD-8086

-- MAJOR CONSTITUENTS --

MAGNESIUM (MG) DIS	2920.0
SODIUM (NA) DIS	373.0
POTASSIUM (K) DIS	1860.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	100.0	24.0
CADMIUM (CD) TOT	11.0	1.5
COPPER (CU) TOT	32.0	21.0
IRON (FE) TOT	19200.0	14000.0
LEAD (PB) TOT	26.0	29.0
MANGANESE (MN) TOT	186.0	40.0
MERCURY (HG) TOT	0.1	
NICKEL (NI) TOT	7.5	
ZINC (ZN) TOT	720.0	57.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
Validation Flags: A:Anomalous; UJ1:Blank; J1,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-29S	DH-29S	DH-29S	DH-30	DH-30
SAMPLE DATE	12/11/1987	12/11/1987	12/11/1987	11/20/1999	11/20/1999
SAMPLE TIME				14:00	14:35
LAB	TSC-SLC	TSC-SLC	VERSR	EHLAB	EHLAB
LAB NUMBER				99X-05094	99X-05095
REMARKS			SPLIT		
TYPE	TOTAL	TOTAL	TOTAL	XRP	XRP
DEPTH	8-10	10-12	10-12	1-3'	3.5-5.5'
SAMPLE NUMBER	HYD-8107.A14	HYD-8108.A14	HYD-8109.A14	IMMS-9910-270	IMMS-9910-271

-- PHYSICAL PARAMETERS --

PH	6.9	6.9
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-- MAJOR CONSTITUENTS --

MAGNESIUM (MG) DIS	3410.0
SODIUM (NA) DIS	658.0
POTASSIUM (K) DIS	1990.0

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	335.0	342.0	1288.0	6739.0
CADMIUM (CD) TOT	40.0	27.0	234.0	3011.0
COPPER (CU) TOT	578.0	1058.0	699.0	111.0
IRON (FE) TOT	18610.0	45325.0	37000.0	
IRON (FE) (%) TOT			10.0	2.0
LEAD (PB) TOT	5070.0	9523.0	6330.0	11574.0
MANGANESE (MN) TOT	625.0	2748.0	2190.0	3985.0
MERCURY (HG) TOT			6.6	
NICKEL (NI) TOT			12.0	
ZINC (ZN) TOT	3250.0	9350.0	26012.0	1082.0

-- OTHER PARAMETERS --

COARSE FRAGMENTS (%)	27.13	78.47
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NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-30	DH-30	DH-30	DH-30	DH-30
SAMPLE DATE	11/20/1999	11/20/1999	11/20/1999	11/21/1999	11/21/1999
SAMPLE TIME	14:40	16:00	16:45	10:30	11:00
LAB	EHLAB	EHLAB	EHLAB	EHLAB	EHLAB
LAB NUMBER	99X-05096	99X-05097	99X-05098	99X-05099	99X-05100
REMARKS	DUPLICATE				
TYPE	XRF	XRF	XRF	XRF	XRF
DEPTH	3.5-5.5'	8-10'	10-12'	15-17'	20-22'
SAMPLE NUMBER	IMMS-9910-271D	IMMS-9910-272	IMMS-9910-273	IMMS-9910-274	IMMS-9910-275

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	6523.0	754.0	731.0	160.0	502.0
CADMIUM (CD) TOT	2855.0	1465.0	1081.0	1686.0	610.0
COPPER (CU) TOT	110.0	190.0	89.0	76.0	138.0
IRON (FE) (%) TOT	2.0	3.0	3.0	3.0	4.0
LEAD (PB) TOT	19079.0	127.0	127.0	93.0	31.0
MANGANESE (MN) TOT	426.0	318.0	694.0	2093.0	579.0
ZINC (ZN) TOT	1045.0	1175.0	1281.0	774.0	1675.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-34	DH-35	DH-35	DH-35	DH-35
SAMPLE DATE	11/04/1999	10/25/1999	10/25/1999	10/25/1999	10/25/1999
SAMPLE TIME	18:00	11:30	11:45	12:00	12:30
LAB	TSC-SLC	EHLAB	EHLAB	EHLAB	EHLAB
LAB NUMBER	L011603048	99X-04488	99X-04489	99X-04490	99X-04491
TYPE	Seq SPLP	XRF	XRF	XRF	XRF
DEPTH	25-27'	0-2'	2-4'	4-6'	6-8'
OTHER INFO	Leach #12				
SAMPLE NUMBER	IMMS-9910-212	IMMS-9910-186	IMMS-9910-187	IMMS-9910-188	IMMS-9910-189

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	0.1	2346.0	1491.0	91.0	222.0
CADMIUM (CD) TOT	<0.001	538.0	445.0	< 10.0	< 10.0
COPPER (CU) TOT		8679.0	6166.0	207.0	138.0
IRON (FE) (t) TOT		4.0	3.0	3.0	5.0
LEAD (PB) TOT		12879.0	8529.0	444.0	182.0
MANGANESE (MN) TOT		1863.0	1500.0	562.0	1354.0
ZINC (ZN) TOT	0.038	8672.0	7505.0	648.0	113.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-35	DH-35	DH-35	DH-35	DH-35
SAMPLE DATE	10/25/1999	10/25/1999	10/25/1999	10/25/1999	10/26/1999
SAMPLE TIME	14:00	14:15	14:35	15:00	16:00
LAB	EHLAB	EHLAB	EHLAB	EHLAB	EHLAB
LAB NUMBER	99X-04492	99X-04493	99X-04494	99X-04495	99X-04496
TYPE	XRF	XRF	XRF	XRF	XRF
DEPTH	8-10'	10-12'	15-17'	20-22'	25-27'
SAMPLE NUMBER	IMMS-9910-190	IMMS-9910-191	IMMS-9910-192	IMMS-9910-193	IMMS-9910-194

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	83.0	72.0	90.0	128.0	221.0
CADMIUM (CD) TOT	< 10.0	< 10.0	< 10.0	57.0	567.0
COPPER (CU) TOT	84.0	114.0	92.0	66.0	70.0
IRON (FE) (I) TOT	4.0	3.0	3.0	3.0	3.0
LEAD (PB) TOT	38.0	56.0	41.0	42.0	26.0
MANGANESE (MN) TOT	950.0	1225.0	1552.0	875.0	517.0
ZINC (ZN) TOT	87.0	109.0	63.0	83.0	77.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-36	DH-36	DH-36	DH-36	DH-36	DH-36
SAMPLE DATE	10/11/1999	10/11/1999	10/12/1999	10/12/1999	10/12/1999	10/12/1999
SAMPLE TIME	16:00	16:45	17:45	9:00	11:10	11:55
LAB	EHLAB	EHLAB	EHLAB	EHLAB	EHLAB	EHLAB
LAB NUMBER	99X-04268	99X-04269	99X-04270	99X-04271	99X-04272	99X-04273
TYPE	XRF	XRF	XRF	XRF	XRF	XRF
DEPTH	0.5-2'	2-2.2'	4-6'	6-8'	15-16'	22-24'
SAMPLE NUMBER	IMMS-9910-143	IMMS-9910-144	IMMS-9910-145	IMMS-9910-146	IMMS-9910-147	IMMS-9910-148

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	447.0	23.0	27.0	21.0	< 10.0	88.0
CADMIUM (CD) TOT	14.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
COPPER (CU) TOT	873.0	54.0	83.0	76.0	66.0	75.0
IRON (FE) (%) TOT	4.0	3.0	4.0	4.0	5.0	3.0
LEAD (PB) TOT	4300.0	80.0	43.0	23.0	21.0	23.0
MANGANESE (MN) TOT	1739.0	643.0	2208.0	1486.0	1446.0	841.0
ZINC (ZN) TOT	28454.0	450.0	192.0	70.0	116.0	73.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL --

SITE CODE	DH-36	DH-36	DH-36	DH-37	DH-37
SAMPLE DATE	10/12/1999	10/12/1999	10/12/1999	11/21/1999	11/21/1999
SAMPLE TIME	13:50	15:00	15:45	17:45	18:00
LAB	EHLAB	EHLAB	EHLAB	EHLAB	EHLAB
LAB NUMBER	99X-04274	99X-04275	99X-04276	99X-05101	99X-05102
TYPE	XRF	XRF	XRF	XRF	XRF
DEPTH	24-26'	26-28'	30-32'	1-3'	3-5'
SAMPLE NUMBER	IMMS-9910-149	IMMS-9910-150	IMMS-9910-151	IMMS-9910-276	IMMS-9910-277

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	161.0	239.0	367.0	916.0	297.0
CADMIUM (CD) TOT	< 10.0	14.0	42.0	93.0	17.0
COPPER (CU) TOT	62.0	54.0	57.0	4887.0	1239.0
IRON (FE) (%) TOT	3.0	3.0	3.0	2.0	2.0
LEAD (PB) TOT	18.0	26.0	17.0	4405.0	1029.0
MANGANESE (MN) TOT	519.0	396.0	767.0	387.0	448.0
ZINC (ZN) TOT	71.0	51.0	64.0	511.0	254.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL BORINGS --

SITE CODE	DH-66S	DH-66S	DH-66S	DH-66S	DH-66S	DH-66S
SAMPLE DATE	07/22/2002	07/22/2002	07/22/2002	07/22/2002	07/22/2002	07/22/2002
SAMPLE TIME	9:00	9:10	9:20	10:20	10:50	12:00
LAB	TACLAB	TACLAB	TACLAB	TACLAB	TACLAB	TACLAB
LAB NUMBER	02R-00949	02R-00950	02R-00951	02R-00952	02R-00953	02R-00954
TYPE	EDXRF	EDXRF	EDXRF	EDXRF	EDXRF	EDXRF
DEPTH	0-2'	3-5'	6-8'	9-11'	15-17'	25-27'
OTHER INFO	SS	SS	SS	SS	SS	SS
SAMPLE NUMBER	DH-66-01	DH-66-02	DH-66-03	DH-66-04	DH-66-05	DH-66-07

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	1052.0	127.0	178.0	15.0	27.0	14.0
CADMIUM (CD) TOT	392.0	97.0	103.0	< 10.0	< 10.0	< 10.0
COPPER (CU) TOT	2472.0	535.0	508.0	45.0	49.0	77.0
IRON (FE) (%) TOT	4.0	2.0	3.0	2.0	6.0	3.0
LEAD (PB) TOT	19608.0	2569.0	3086.0	22.0	25.0	47.0
MANGANESE (MN) TOT	1330.0	393.0	508.0	402.0	495.0	624.0
ZINC (ZN) TOT	10780.0	1390.0	1911.0	88.0	42.0	53.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

-- SAMPLE TYPE: SOIL BORINGS --

SITE CODE	DH-66S	DH-66S	DH-66S	DH-66S	DH-66S
SAMPLE DATE	07/22/2002	07/22/2002	07/22/2002	07/22/2002	07/22/2002
SAMPLE TIME	12:40	14:10	15:00	15:50	17:00
LAB	TACLAB	TACLAB	TACLAB	TACLAB	TACLAB
LAB NUMBER	02R-00955	02R-00956	02R-00957	02R-00958	02R-00959
TYPE	EDXRF	EDXRF	EDXRF	EDXRF	EDXRF
DEPTH	30-32'	35-27'	40-42'	45-57'	50-52'
OTHER INFO	SS	SS	SS	SS	SS
SAMPLE NUMBER	DH-66-08	DH-66-09	DH-66-10	DH-66-11	DH-66-12

-- METALS & MINOR CONSTITUENTS --

ARSENIC (AS) TOT	14.0	< 10.0	13.0	22.0	11.0
CADMIUM (CD) TOT	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
COPPER (CU) TOT	103.0	101.0	52.0	77.0	52.0
IRON (FE) (%) TOT	3.0	3.0	7.0	3.0	1.0
LEAD (PB) TOT	35.0	57.0	34.0	28.0	57.0
MANGANESE (MN) TOT	811.0	541.0	380.0	946.0	286.0
ZINC (ZN) TOT	96.0	84.0	39.0	32.0	108.0

NOTES: All results in mg/L (Water) or mg/kg (Soil) unless noted and are laboratory (LAB) unless field (FLD) or calculated (CALC)
 TOT:Total; DIS:Dissolved; TRC:Total Recoverable; E:Estimated; <:Less Than Detect. Blank: parameter not tested
 Validation Flags: A:Anomalous; UJ1:Blank; J2,UJ2: Standard; J3:Hold Time; J4,UJ4:Duplicate, Spike, or Split Exceedance;
 R:Rejected.

APPENDIX B

**IRS ENVIRONMENTAL HAZARDOUS
MATERIALS ABATEMENT PLAN**

HAZARDOUS MATERIALS ABATEMENT PLAN

**ASBESTOS CONTAINING MATERIALS AND LEAD DUST CLEANING
ASSOCIATED WITH THE
ASARCO PHASE 4 BUILDING CLEANING AND DEMOLITION**

Submitted to:

**Cleveland Wrecking Company
628 E. Edna Pl.
Covina, California 91723**

Prepared by:

**Darin Dietz
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April 16, 2007

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1.0 Introduction

- 1) IRS Environmental of WA (IRSE) has been contracted by Cleveland Wrecking Company, to abate hazards associated with the asbestos-containing materials (ACMs) that were identified in the structures and lead dust cleaning before selective demolition of the Asarco Lead Smelter Plant, located in East Helena, Montana.
- 2) This work plan describes the methods and procedures IRSE shall utilize to remove the subject ACM and lead dust. Sections 2.0 through 7.0 describe the applicable standards and regulations, site supervision, removal procedures and waste handling, WISHA air monitoring and the laboratory analytical procedures for each building scheduled for ACM abatement and/or lead dust cleaning. Appendix A of this work plan identifies the specific scope of work for each building scheduled for asbestos abatement and/or lead dust cleaning.
- 3) This plan is intended to address removal of ACM and lead dust cleaning from the subject structures.

2.0 Asbestos Abatement and Lead Dust Cleaning- Applicable Standards and Guidelines

- 1) Asbestos abatement work under this contract will be performed in accordance with all federal, state, and local laws, regulations, standards, and codes governing asbestos abatement. Before starting work, IRSE will provide proper notification Montana Department of Environmental Quality (DEQ).
- 3) IRSE will comply with all provisions of the Montana Asbestos Work Practices and Procedures Manual adopted and incorporated by the reference in the administrative Rules of Montana, Title 17, Chapter 74 Subchapter 3 as it pertains to safety in employment and the applicable provisions of DEQ General Safety and Health Standards as it pertains to occupational safety and health in the workplace. In addition, IRSE will comply with Title 29 CFR 1910 and 1926. The most recent edition of any regulation, standards, document, or code will be in effect. When conflict among the requirements or with this work plan exists, the more stringent requirement(s) will be applied.

In addition, IRSE will comply with all provisions of the Federal OSHA standards applicable to construction work where employees may be exposed to lead (Title 29 CFR 1910 and 1926.62). The most recent edition of any regulation, standards, document, or code will be in effect. When conflict among these requirements or with this work plan exists, the more stringent requirement(s) will be applied.

- 4) Initial exposure assessments will also be conducted at the beginning of all abatement activities in accordance with Title 29 CFR 1926.1101.

3.0 Site Supervision and Certification

- 1) IRSE is a licensed asbestos abatement contractor in the State of Montana. All work will be supervised by Mark Kazemba, a state-certified Asbestos Supervisor and has completed the 40 hour hazwoper training. All supervisors are AHERA trained competent persons.
- 2) Supervisory duties will include, but will not be limited to, controlling site access and implementing proper air sampling protocols, as well as appropriate controls to prevent exposure to ACMs and lead. It is also the competent person's responsibility to ensure adequacy of engineering controls and to exercise the authority to select appropriate control strategies up to and including shutdown of the work if conditions are warranted.
- 3) All workers conducting ACM removal activities will be medically qualified and trained for asbestos work involving respirator usage.
- 4) All workers conducting lead dust cleaning will be medically qualified and trained for lead removal work involving respirator usage.

4.0 Site Safety and Health Plan

4.1 General

- 1) IRSE will be responsible for safety and health at the Asarco Phase 4 Building Cleaning and Demolition Project during anticipated asbestos abatement and lead cleaning activities. This includes, but is not limited to, electrical safety, equipment operation safety, mechanical (tool) safety, fire safety, and personnel protective equipment safety.
- 2) The *IRSE Site Specific Hazard Analysis* plan for the Asarco Phase 4 Building Cleaning and Demolition Project (see Appendix D) was developed to be used in conjunction with this Asbestos and Lead Dust Abatement Work Plan. Information found in this Work Plan, including air sampling, decontamination procedures, and work activities should be used to supplement the information contained in the *IRSE Site Specific Hazard Analysis Plan for the Asarco Phase 4 Building Cleaning and Demolition Project*. (see Appendix D).

4.2 Work Site Safety

- 1) Before initiating asbestos or lead cleaning abatement work, IRSE will set and post emergency procedures in a conspicuous place at each active abatement site. The emergency procedures will include provisions for the following:
 - Evacuation of injured workers
 - Emergency and fire egress routes from all work areas, including local telephone numbers for fire and medical emergency personnel, site of hospital routing maps
 - Copies of applicable insurance certificates
 - Entry logs.
- 2) At a minimum, two IRSE personnel with the proper training and certified in basic first aid and cardiopulmonary resuscitation (FA/CPR) will be at each active work site. A general first aid kit will be maintained in the support area for treating minor medical problems.

4.2.1 Work Area Access

Removal work areas will be clearly marked with barrier tape or other means to warn personnel of the hazards. Immediately adjacent to the removal work area (regulated work areas) a decontamination area for equipment and personnel will be established. The remainder of the IRSE project area will be designated as the support zone. No special markings or warning labels are required for this area.

4.2.2 Hazard Briefing/Site Safety Operation

- 1) No person will be allowed on the site during active abatement activities without first being given a site hazard briefing. In general, the briefing will consist of a review of the Work Plan and the tailgate safety meeting. All persons on the site, including visitors, must sign the site-specific tailgate safety meeting form. Tailgate safety meetings shall be held prior to the start of any work activities involving all personnel on site.

4.2.3 Entry Log

- 1) The IRSE Competent Person shall record the names and times of entry and exit of all personnel who enter the asbestos removal and lead dust cleaning work areas (regulated work area).

4.2.4 Entry Requirements

- 1) Entry into regulated work areas shall be only by personnel authorized by the State Certified Supervisor, Competent Persons, and Personnel authorized to enter regulated work areas shall be trained and medically evaluated and shall wear the PPE required.
- 2) IRSE will be responsible for the security of the work areas of the building(s) involved in the abatement project and secure all assigned entrances and exits at the end of the work day so as to prevent unauthorized entry.
- 3) The tailgate safety meeting log will be maintained and reflect the name of any and personnel attending.

4.3 Worker Protection Requirements

4.3.1 General

- 1) Danger signs and tape will be posted and meet the specifications of DEQ and OSHA Construction Standards wherever regulated work areas are created. Signs will be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure.
- 2) Electrical power systems located in active abatement areas are de-energized, shut down and locked out and temporary power and lighting sources (if applies) will be provided to the area. The temporary power will be installed in a manner that is consistent with all applicable electrical code, WISHA, OSHA, and IT requirements for temporary electrical systems (if applies).
- 3) A sufficient quantity of negative pressure ventilation units equipped with HEPA filtration and operated in accordance with ANSI 29.2 through 79 (local exhaust ventilation requirements) shall be utilized when needed to provide adequate ventilation, or to provide four air changes per hour inside negative pressure enclosures.

4.3.2 Asbestos Abatement Training

- 1) Training shall be provided to all employees or agents who may be required to disturb asbestos for abatement and auxiliary purposes and to supervisory personnel who may be involved in planning, execution, design, or inspection of abatement projects. Asbestos abatement workers and supervisors must have successfully completed Washington State approved training courses and have state certification cards on site at all times when working.

Inspection undertaken to determine the presence of additional asbestos will be conducted by MCS Environmental, who are currently EPA Certified Building Inspectors. Project design personnel will also be EPA certified. Worker and supervisory certificates and training documentation are located in Appendix B.

2) Worker training shall provide, at a minimum, information on the following topics:

- The health hazards of asbestos, including the nature of various asbestos-related diseases, routes of exposure, known dose-response relationships, the synergistic relationship between asbestos exposure and cigarette smoking, latency periods for disease and health basis for standards.
- The physical characteristics of asbestos, including fiber size, aerodynamic properties, physical appearance, and uses.
- Employee PPE, including the types and characteristics of respirator classes, limitations of respirators, proper selection, inspection, donning, use, maintenance and storage of respirators, field testing the face-piece-to-face seal (positive and negative pressure fitting tests), qualitative and quantitative fit testing procedures, variations between laboratory and field fit factors, factors that affect respirator fit (e.g., facial hair), selection and use of disposable clothing, use and handling of launderable clothing, nonskid shoes, gloves, eye protection, and hard hats.
- Medical monitoring requirements for workers include required and recommended tests, reasons for medical monitoring, and employee access to records.
- Air monitoring procedures and requirements for workers, including description of equipment and procedures, reasons for monitoring, types of samples, and current standards with recommended changes.
- Work practices for asbestos abatement include proper construction and maintenance of air-tight plastic barriers, job set-up of airlocks, worker decontamination systems and waste transfer airlocks, posting of warning signs, engineering controls, electrical and ventilation system lockout, proper working techniques, waste cleanup and disposal procedures.
- Personal hygiene, including entry and exit procedures for the work area, use of showers and prohibition of eating, drinking, smoking, and chewing in the work area.
- Special safety hazards that may be encountered, including electrical hazards, air contaminants (CO2 wetting agents, encapsulant, and materials from Owner's operation), fire and explosion hazards, scaffold and ladder hazards, slippery surfaces, confined spaces, heat stress, and noise.
- Workshops affording both supervisory personnel and abatement workers the opportunity to see (and experience) the construction of containment barriers and decontamination facilities.

- Supervisory personnel shall, in addition, receive training or contract specifications, liability insurance and bonding, legal considerations related to abatement

establishing respiratory protection medical surveillance programs, EPA, OSHA, and State record-keeping requirements.

- 3) Training must be provided by Washington State approved training providers and must be current, each employee having training certification renewed every 12 months as required by regulation.

4.3.3 Lead Dust Removal Training

- 1) Training shall be provided to all employees or agents who may be required to disturb Lead Dust, and to supervisory personnel who may be involved in planning, execution, design, or inspection of Lead Dust removal projects.

Lead Dust removal supervisors will have successfully completed the Lead in Construction Training Course and will hold current certification. Lead removal workers will have completed Four Hour Lead Awareness Training for Lead in Construction as required by WISHA and OSHA.

- 2) Worker training shall provide, at a minimum, information on the following topics:

- The Content Lead and Title 29 CFR 1910 and 1926.62
- The specific nature of operations which could result in exposures to lead above the action level
- Training requirements for respirators as required by 296-62 WAC, Part E and 29 CFR 1926.103
- The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females and hazards to the fetus and additional precautions for employees who are pregnant)
- The engineering controls and work practices associated with the employees job assignment including training of employees to follow relevant good work practices described in Appendix B, WAC 296-155-17652 and 29 CFR 1926
- Instructions that chelating agents should not routinely be used to remove lead from the body and should not be used at all except under the direction of a licensed physician
- The employees right of access to records under Part B, chapter 289-62 WAC and 296-800 WAC

4.3.4 Respiratory Protection

- 1) Each worker involved in abatement shall be instructed in the proper use of respirators.
- 2) A sufficient quantity of respirator filters approved for asbestos and lead work will be available. Respirators and unused filters, if applicable, will be stored at the job site in the changing room to protect them completely. The filters used will be high efficiency particulate air (HEPA).
- 3) Workers must perform a field fit test/inspection of their respirator as specified by the manufacturer.
- 4) No one wearing a beard shall be permitted to don a respirator and enter the work area.
- 5) Additional respirators and training on their donning and use must be available at the work site for authorized visitors who may request to enter the work area.

4.3.4 Other Personal Protective Equipment

- 1) Personal protective equipment that includes Tyvek or polypropylene coveralls with hoods, hard hats, respirators, and nitrile gloves will be provided in sufficient quantities and adequate sizes for all workers and authorized visitors.
- 2) Protective eyewear and hard hats shall be provided as required for workers and authorized visitors for use outside of the containment area.

4.3.5 Medical Monitoring –Asbestos Abatement

- 1) Medical monitoring must be provided to any employee that may be exposed to asbestos in excess of background levels during any phase of these abatement projects. The purposes of a medical monitoring program are to determine work relatedness of disease, as well as to ensure fitness for duty, particularly the ability to wear a respirator. The medical monitoring program provides the appropriate setting to share this information. Medical monitoring shall include, at a minimum, the requirements of 29 CFR 1926 and IRSE Medical Compliance Plan.
 - A work/medical history to elicit symptomatology of respiratory disease.
 - A chest x-ray (posterior-anterior, 14 x 13 in.) taken by a certified radiologist technician and evaluated by a certified B-reader.
 - A pulmonary function test, including forced vital capacity (FVC) and forced expiratory volume at one second (FEV1), and FEV1/FVC ration (administered by a NIOSH or American Thoracic Society (ATS) Certified Pulmonary Technician) and interpreted and compared to standardized normalcy by a Board Certified Pulmonary Specialist.

- Employees shall be given the opportunity to be evaluated by a physician to determine their capability to work safely while breathing through the added resistance of a respirator. Examining physicians shall be aware of the nature of respiratory protective devices and their contributions to breathing resistance. They shall also be informed of the specific types of respirators the employees shall be required to wear and the work they will be required to perform, as well as special workplace conditions, such as high temperatures, high humidity, and chemical contaminants to which employees may be exposed.
- Evaluation of groups of workers should take into consideration epidemiologic principles as suggested by the ATS in its statement on the work relatedness of disease adopted in 1982.

4.3.6 Medical Monitoring – Lead Abatement

- 1) Medical monitoring will be provided to any employee that may be exposed to airborne lead in excess of the action level of $30 \mu\text{g}^3$ during any phase of the Lead dust cleaning process. The purposes of a medical monitoring program is to provide baseline blood lead levels and to provide ongoing biological monitoring to insure engineering controls are effective, as well as to ensure fitness for duty, particularly the ability to wear a respirator. The medical monitoring program provides the appropriate setting to share this information.

Medical monitoring shall include, at a minimum, the requirements of 29 CFR 1926.62 and WAC 296-155-17629:

- An accurate record for each employee including Name, Social Security Number, and a description of the duties of each employee.
- A copy of the physician's written opinions, including those related to fitness for respirator use
- Results of any airborne exposure monitoring done on or for that employee and provided to the Physician
- Each employee shall be given the opportunity to be evaluated by a physician to determine their capability to work safely while breathing through the added resistance of a respirator. Examining physicians shall be aware of the nature of respiratory protective devices and their contributions to breathing resistance. They shall also be informed of the specific types of respirators the employees shall be required to wear and the work they will be required to perform
- Any employee medical complaints related to exposure to lead
- A copy medical examination results and description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information (to be retained by doctor).
- A copy of the results of biological monitoring.

4.4 Emergency Contingency Plan

- 1) Site personnel must be prepared to respond and act quickly in the event of an emergency. The following emergency preparedness and response procedures will aid in protecting site workers and the surrounding environment.

4.4.1 General

- 1) The Site Safety Officer will establish evacuation routes and assembly areas for the abatement site. All personnel entering the work area will be informed of these routes and assembly areas. Evacuation routes, rally points, and the locations of emergency equipment will be included on the site map contained within the work plan prior to the initiation of on-site activities.
- 2) In the case of site evacuation, the following procedures shall be observed:
 - Stop working, secure equipment, and return to the decontamination area for decontamination
 - Exit building
 - Walk to the designated rally point using the evacuation route
 - Notify the on-site IRSE Competent Person, Project Manager and the Environmental Health and Safety representative
 - Remain at the rally point until further information is received
- 3) Personnel should not stand in roads, driveways, or in front of gates, as these locations may be used by emergency and support vehicles entering the site.
- 4) Each site activity will be evaluated for the potential for fire, explosion, chemical release, or other catastrophic events. Unusual events, activities, chemicals, and conditions will be immediately reported to the Competent Person.

4.4.2 Emergency Procedures

- 1) If an incident (personal or vehicle accident, property damage, or near miss) occurs, the following procedures will be used:
 - The Competent Person will evaluate the incident, assess the need for assistance, and notify the Project Manager.
 - The Competent Person will call for outside assistance as needed.
 - The Competent Person will act as liaison between outside agencies and on-site personnel.

- The Competent Person will take appropriate measures to stabilize the incident scene.
- The IRSE Project Manager will provide technical guidance to the Competent Person as needed and notify the MCS's representative.
- The Competent Person will ensure that any injured employee's supervisor completes an injury report form and forwards the form to the Project Manager or Site Safety Officer.

4.4.3 Safety Signals

- 1) While working on site, the following hand signals will be used for communication when necessary.

<u>Hand Signal</u>	<u>Meaning</u>
Arms crossed over head	Shut off equipment
Hand gripping throat	Out of air, can't breathe
Both hands around waist	Leave area immediately
Wave hands over head	Need assistance
Thumbs up	Okay, I am all right, I understand
Thumbs down	No, negative

- 2) Vehicle or portable air horns will be used for alarm signals as follows:
 - One long blast: Emergency evacuation of the site
 - Two short blasts: Clear working area around powered or moving equipment

4.4.4 Medical Emergency

4.4.4.1 General

- 1) Prior to field work, Site Health and Safety Officer will contact and coordinate with all potential emergency response organizations so that they will be aware of any potential site hazards and can meet training and medical requirements. All employee injuries must be promptly reported to the Competent Person. The Competent Person will:
 - Ensure that the injured employee receives prompt first aid and medical attention.
 - Contact Emergency Services at 911 and state clearly "This is a emergency at the East Helena Asarco Plant" ever medical attention is required to ensure that appropriate services are provided.
 - Complete the appropriate form or forms and submit them to the Project Manager or Site Safety Office within one business day of an incident. Forms include:
 - Supervisor's Employee Injury Report (to be completed by the employee's supervisor)

- Vehicle Accident Report
- General Liability, Property Damage and Loss Report
- Ensure that the Project Manager and Site Safety Officer are immediately notified of the incident.
- Initiate an investigation of the incident, with the assistance of a representative prior to restarting work activities.

4.4.4.2 Chemical Inhalation

- 1) Any employee complaining of symptoms of chemical overexposure will be removed from the work area and transported to the designated medical facility for examination. The Competent Person must contact the Project Manager and Site Safety and Health Officer immediately.

4.4.4.3 Eye Contact

- 1) Project personnel who have had contaminants splashed in their eyes or who have experienced eye irritation while on the site shall immediately proceed to the eyewash station. Do not decontaminate before using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Thoroughly flush the eye with clean water. Arrange prompt transport to the designated medical facility.

4.4.4.4 Skin Contact

- 1) Project personnel who have had skin contact with contaminants will, unless the contact is severe, precede through the decontamination facilities to the wash-up area. Personnel will remove any contaminated clothing, and then wash the affected area with water. The worker should be transported to the medical facility listed below if they show any sign of skin reddening or irritation or if they request a medical examination, MSDS should be made available to medical staff for evaluation, if available.

4.4.4.5 Personal Injury Accident

- 1) In the event of a personal injury accident, the Competent Person will assess the nature and seriousness of the injury. In the case of serious or life-threatening injuries, normal decontamination procedures may be abbreviated or bypassed. Less serious injuries, such as strains, sprains, minor cuts, and contusions, may only be treated after the employee has been decontaminated.

Following decontamination, an IRSE project team member qualified in FA/CPR will administer suitable first aid. The Competent Person will then, if necessary, arrange transport to the appropriate medical facility. The Project Manager must be notified of all recordable injuries, illnesses, and vehicle accidents. Washington State Department of Labor and Industries must be verbally notified within eight hours of any accident resulting in a fatality, within 24 hours of in-patient hospitalization.

- 2) Because the bites of snakes, spiders, scorpions are rare, the recommended treatment is outlined here as a reminder in case of a bite. DO NOT cut the site of the bite and suck out the venom, but rather lie the victim down and keep the person calm. Try to keep the affected area lower than the heart. Ice may be applied to the area of the bite but make sure that there is no direct skin contact with the ice. Use a towel for insulation to prevent freezing the skin. DO NOT use a tourniquet or constricting band on the affected limb. Get the victim to medical attention.

4.4.4.6 Fire

- 1) In the case of a fire on the site, the Competent Person will assess the situation and determine the proper response. All personnel NOT trained in the use of fire extinguishers shall evacuate the area involved. Only IRSE personnel trained in the use of extinguishers may attempt to extinguish the fire with available extinguishers if it is safe to do so. If these trained employees do not wish to make the attempt, they are to evacuate also. In the event of ANY fire, IRSE will call the East Helena Fire Department at the number listed in the Site Specific Safety Plan and notify the Site Safety and Health Officer immediately. Fire fighting is a job for the fire department. No property or equipment is so important as to risk an employee's life.

4.5 Failure of Work Area Containment System (where applicable)

- 1) The work enclosure and negative air system will be closely monitored for failure or a breach. If such an event occurs, the work inside would immediately stop and the problem resolved. A breach in containment could be quickly repaired with duct tape; if the negative air system is the source of problems, the cause of the malfunction will be determined, and the necessary repairs or replacements made so that work can resume.
- 2) Asbestos waste that can be vacuumed will be contained in a HEPA vacuum. The bagged waste from the operation would not create a spill hazard. The asbestos waste inside the HEPA vacuum will be removed inside a containment area built specifically for this purpose.

4.6 Emergency Information

- 1) Before the start of the project, contact will be made with local authorities and emergency services to establish a communication channel during an event of emergency and to familiarize the project personnel with the communication procedures and services. Pertinent emergency information will be included on the daily tailgate safety meeting forms.
- 2) The Site Specific Safety Plan at Appendix E contains directions to St Peter's Hospital (see also Emergency Phone List attached).

4.6.1 Key Project Personnel

IRSE Project Manager	Carl Burnham	509-927-7867 509-998-8257	office mobile
IRSE Competent Person	Mark Kazemba	509-884-4267	mobile
IRSE Health and Safety Officer	Robert Reed	509-927-7867	
CWC Project Manager	_____	_____	office mobile
CWC Safety and Health Officer	_____	_____	office mobile
Asarco Plant Manager	Blaine Cox	406-227-4098 406-459-8542	office cell
Asarco Environmental Manager	Jon Nickel	406-227-4529	office
Department of Environmental Quality		406-444-5300	office
OSHA Regional Office		406-247-7494	office (Billings)
Montana DEQ (NEHEPS)	John Podolinski	406-444-2690 406-444-1499	office fax
Occupational Medicine Associates	Dr. Royce Van Gerpin	509-455-5555	office

4.6.2 Medical Care Facilities

Saint Peter's Hospital
2475 Broadway
Helena, MT 59601
(406) 442-2480

4.6.3 Emergency Telephone Numbers

Emergency	911 Notify Emergency Crews: <i>Say "This is an emergency at the E Helena Asarco lead smelter"</i>
National Response Center (spills)	800 - 424-8802
Regional Poison Control Center	800 - 525-5042
Fire Department	406-227-5377 (Dispatch) or 911
Police Department	406-227-5377 (Dispatch) or 911

5.0 Asbestos and Lead Removal Techniques and Procedures

- 1) Asbestos-containing materials that will be removed from the site buildings and are judged by a competent person to be friable (i.e., those ACMs that, when dry, can be crushed, crumbled, pulverized, or otherwise rendered to a dust by hand pressure) will be packaged and stored in a manner prescribed herein for disposal as hazardous waste.
- 1) Lead Dust is present within the interiors of structures schedule to be demolished. These structure will be cleaned of the dust before demolition of the structure.
- 2) Lead Dust waste that is collected during cleaning of the structures will be packaged and stored in a manner prescribed herein for disposal as hazardous waste.

5.1 Notifications

- 1) IRSE will make required notifications to the Department of Environmental Quality and submit these notifications to CWC before beginning work.

5.2 Work Area Preparation

5.2.1 Warning Signs – Asbestos Abatement

- 2) Danger signs meeting the specifications of OSHA Construction Safety Order, Section 1529 and WAC 296-62-077 will be posted at any location and approach where regulated areas are present. Signs will be posted at a distance sufficiently far enough away from the work areas to permit any employee or visitor to read the sign and take the necessary protective measures to avoid exposure. Warning signs shall include the following wording:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA**

- 2) These warning signs shall be printed in letters of sufficient size to be clearly legible.

5.2.2 Warning Signs- Lead Dust Abatement

- 3) Entrance by non- trained personnel into the lead paint removal area will be restricted using 3" barrier tape posted at the work area perimeter. Warning tape shall include the following wording:

**Danger Lead Removal
Authorized Personnel Only**

- 2) The warning tape shall be printed with letters of sufficient size to be clearly legible.

5.2.3 Electrical Power

- 1) The contractor will provide adequate power at each of the buildings. IRSE will provide temporary lighting sources and ensure safe installations (including ground faulting) of temporary power sources and equipment by complying with all applicable electrical code requirements and OSHA requirements for temporary electrical systems, within each building, as applies.

5.2.4 Establishing Asbestos Removal Work Areas

- 1) During indoor Class I removal of thermal system insulation, the wrap and cut method will be utilized. (HEPA) vacuums and wet methods will be utilized.
- 2) As applicable, IRSE will seal the exterior of the regulated areas. All windows, doors, and any other openings to the outside of the building from the regulated areas, will be sealed with a minimum of one layer of 6-mil poly sheeting with duct tape, until a negative exposure assessment is conducted.
- 3) During Class I removal of TSI using glovebag and wrap and cut methods with HEPA vacuum method procedures, the work area will be restricted using signs as described in 5.2.1. 6-mil poly will be installed on floors/ground in work area. Negative air machines may be installed in order to provide clean air from outside the work area at sufficient quantities and at strategic locations, so as to provide clean air in the workers' breathing zone, as described in Appendix D IRSE Hazardous Material Contractor Quality Control Plan.
- 4) During outdoor Class II removal of transite shingles and skirting, a single layer of 6-mil poly will be placed on the ground directly under the material to be removed, extending 10-20' out from the base of the building.
- 5) During outdoor Class II removal of metal siding, a single layer of 6-mil poly will be placed on the ground directly under the material to be removed, extending 10-20' out from the base of the building.
- 6) During Class II removal of floor covering, the work area will be restricted using signs as described in 5.2.1. 6-mil poly will be installed critical in the work area. Negative air machines will be installed in order to provide clean air from outside the work area at sufficient quantities and at strategic locations, so as to provide clean air in the workers' breathing zone, as described in Appendix D IRSE Hazardous Material Contractor Quality Control Plan.
- 7) During Class II removal of asbestos-containing roofing materials a single layer of 6-mil poly will be placed on the ground directly under the material to be removed, extending 10-20' out from the base of the building.
- 8) During Class II removal of window caulking, a single layer of 6-mil poly will be placed on the ground directly under the material to be removed, extending 5-10' out from the base of the building.

- 8) During removal of all Class II work, the area will be restricted using signs described in 5.2.1. Specific means and methods will be found in Appendix D.
- 6) 2" red "DANGER ASBESTOS - DO NOT ENTER" tape will be used to restrict access by untrained personnel.

5.2.5 Establishing Lead Dust Removal Work Areas

- 1) As applicable, IRSE will seal the exterior of the regulated areas. All windows, doors, and any other openings to the outside of the building from the regulated areas, will be sealed with a minimum of one layer of 6-mil poly sheeting with duct tape, until a negative exposure assessment is conducted.
- 2) 2" red "DANGER LEAD - DO NOT ENTER" tape will be used to restrict access by untrained personnel.

5.3 Workplace Entry and Exit Procedures – Asbestos and LEAD

- 1) IRSE will be using mobile trailer designed as a 3-stage worker decontamination unit, and a fixed worker decontamination unit (2- or 3-stage, depending on the scope of work at each individual work site) and locate it next to the entrance of the work area.
- 2) If the quantity of thermal system insulation exceeds 10 linear feet or 25 square feet, IRSE will construct a three-stage decontamination unit, including clean room, shower and dirty room, contiguous to the "regulated work area". If the quantity of ACM to be abated is less than 10 linear feet or 25 square feet, IRSE will construct a two-stage decontamination unit, including clean room and dirty room, contiguous to the "regulated work area". The procedures that will be used to enter decontamination units are described below.
- 3) Workers will enter the regulated work areas through the worker decontamination unit. The decontamination unit is a fully enclosed system.
- 4) These decontamination units will include an equipment or "dirty" room, a functional shower equipped with hot and cold running water (if necessary), and a changing or "clean" room in series. The decontamination units will also be constructed in such a manner as to provide a systematic reduction of contamination for the workers and equipment exiting the regulated work area. Personnel entry into and egress from the regulated work areas will be through the decontamination units. Equipment and material replenishment may also be conducted through the decontamination unit.
- 5) Wastewater resulting from the operation of the shower units shall be filtered with a 5-micron pore-size filtration system before reuse or discharge. To the extent feasible, filtered wastewater will be reclaimed and used on site for application in wet method work practices. Wastewater to be discharged shall be sufficiently filtered to meet state and local water quality objectives before discharge. Filters shall be changed as necessary to achieve this objective.

- 6) Before exiting the work area, personnel shall remove outer protective clothing and use a HEPA vacuum to remove ACM debris from protective clothing. Workers shall then proceed to move disposable clothing and dispose of it as hazardous waste. Non-disposable clothing (such as work boots) shall be decontaminated before being removed from the work area.

**Removing asbestos dust from protective clothing or equipment by blowing, shaking, or any other means that disperses asbestos fibers into the air shall likewise be prohibited.

- 6) If applicable, workers exiting the regulated work areas will wash (shower) all areas of the body that were potentially exposed to asbestos contamination. Respirators shall continue to be worn by workers until the worker has entered the shower and begun to wash. Once the head has been deluged with water, the respirator may be removed. IRSE will supply workers with soap and shampoo to use in the showers.
- 7) A secure change room shall be provided outside the decontamination units and shall be equipped with storage for workers' street clothes and personal belongings. Workers are to change from street clothes each day before entering the regulated work area. Workers are to change back into street clothes each day before leaving the work site. Personnel are prohibited from wearing potentially contaminated clothing off the site. Housekeeping within the change room will be maintained by IRSE. Periodic area air monitoring will be conducted to evaluate housekeeping efforts.
- 8) Waste containers shall also be decontaminated using HEPA vacuums and by wet wiping before being removed from the work areas.
- 9) In the event an emergency egress from within the regulated work is required, the above-described personnel decontamination procedures will not be required. IRSE will exercise judgment to ensure that worker health and safety is placed above environmental contamination concerns.
- 10) In those instances when it is not feasible to provide shower facilities contiguous with the work area or where the work is performed outdoors, the Contractor shall ensure that employees remove (1) asbestos contamination from their worksuits in the equipment room utilizing a HEPA vacuum before proceeding to a shower that is not adjacent to the work area, or (2) their contaminated worksuits in the equipment room, don a clean worksuit, and proceed to a shower that is not adjacent to the work area. A second inner disposable/breathable Tyvek whole-body coverall may be utilized by workers for modesty's sake under the primary outer worksuit. The outer suit will be cleaned using a HEPA vacuum and removed within the isolated work area.
- 11) The containment design and decontamination unit that will be utilized for each work area will be dependent on the DEQ asbestos work classification.

5.4 Personal Protective Equipment

- 1) Except when more stringent requirements are set forth, the personal protective equipment (PPE) utilized during the conduct of this work must meet or exceed the requirements contained in Title 29 CFR 1926.1101.

5.4.1 Respiratory Protection

- 1) Half-face negative pressure respirators (equipped with HEPA filters) will be utilized for Class I and II materials being removed on this project. Protective glasses or goggles worn by workers will conform to the specifications of the ANSI Z87.1 standard of Title 29 CFR §1910.133.
- 2) Half-face negative pressure respirators (equipped with HEPA filters) will be worn by all personnel working within Lead Dust Removal Work Areas.
- 3) Once a negative pressure enclosure (if applies) has been visually inspected and placed under a negative air pressure differential, full-faced supplied air respirators operated in constant flow or pressure demand mode and equipped with HEPA escape filters, will be worn by workers, supervisors, work monitors, industrial hygienists, and other entering the regulated work area.
- 3) During outdoor Class II removal of materials, half-face negative pressure respirators equipped with HEPA filters will be used.
- 4) During indoor Class II removal of all materials identified, half-face negative pressure respirators equipped with HEPA filters will be used.
- 5) All respirators shall be used in a manner consistent with state-of-the-industry practices. The respirators shall be worn with head straps in direct contact with the head and shall not be worn on the outside of the hoods of disposable whole-body coveralls. An exception to this is allowable in those instances when a remote decontamination unit is being utilized and the worker is double suited. Respirators shall be worn until proper personal decontamination methods, as described herein, are completed.
- 6) The Contractor will provide respirators in accordance OSHA 1019.133 Respirator Protection

5.4.2 Whole Body Protection

- 1) Work boots with nonskid soles or impermeable work-boot covers shall be worn by workers. Protective footwear worn by workers shall conform to the specifications of the ANSI Z41.1 standard. Work boots that have come into contact with contaminated material shall be cleaned, decontaminated, and bagged before removal from the work area.
- 2) Protective head gear (hard hats) shall be worn at all times that work is in progress. Protective head gear worn by workers shall conform to the specifications of the ANSI Z89.1 (Class A) standard. Hard hats shall be thoroughly decontaminated before removing from the work area.

3) In work areas where excessive noise is prevalent, worker shall wear hearing protection sufficient to ensure that the worker's 8-hour time-weighted average (TWA) exposure does not exceed 85 DbA.

4) IRSE will make available extra sets of PPE to be used by the owners authorized representative for use to enter the regulated work areas.

5.5 Asbestos Removal Techniques and Procedures

1) For the purposes of this work plan, the removal of ACM thermal system insulation (TSI) or ACM surfacing materials will be considered "Class I Asbestos Work," as defined by OSHA 1915.1001 and Title 29 CFR 1926.1101 and shall be conducted in accordance with work practices and requirements set forth for Class I work.

2) IRSE will conduct the construction activities described herein in accordance with all currently applicable federal, state, and local laws and regulations including, but not limited to, Title 29 CFR 1926.1101.

3) All asbestos-containing material thermal system insulation will be removed via the glovebag method or glovebag and wrap and cut method, with negative air ventilation procedures.

5.5.1 Removal of ACM Thermal System Insulation from Buildings

5) IRSE will then pre-clean the work area. This will entail cleaning of any visible asbestos debris and dirt which may affect area and clearance air monitoring. Following pre-cleaning, IRSE will begin installing glovebags on the pipes which have been determined to contain asbestos-containing thermal system insulation.

6) The IRSE Competent Person will then conduct visual inspections and smoke testing on the glovebags and ensure that all necessary tools are present, including Hudson sprayers, waste bags, and a HEPA vacuum.

7) Only after satisfactory visual inspections from the IRSE Competent Person will the go ahead to begin asbestos removal be given.

8) All glovebagging will be conducted in two-man crews. One worker will remove the asbestos-containing pipe insulation inside the glovebag while the other worker constantly mists the insulation with amended water.

9) Once the ACM insulation has been removed from the pipe and is on the bottom of the glovebag, the pipe and top inside portion of the glovebag will be wet wiped clean. IRSE will twist the bag several times and tape it to keep the ACM in the bottom during removal of the glovebag from the pipe. A HEPA vacuum should be used to evacuate air out of the glovebag.

10) A 6-mil disposal bag will be slipped over the glovebag (while still attached to the pipe). The tape holding glovebag to pipe will then be removed and the top of glovebag opened then folded down into waste bag.

- 11) Following an acceptable visual inspection from the CWC Site Safety Officer, IRSE will apply an encapsulant to all surfaces in the work area and clearance sampling can be collected for analysis.

5.5.2 Outdoor Removal of Transite Shingles and Metal Siding

- 1) The workers will don appropriate PPE as described in Section 5.4.
- 2) IRSE will perform setup of the work area as described in Section 5.2.3(3).
- 3) IRSE will notify the on-site Safety Officer prior to beginning removal so that visual inspections can be conducted to insure that all necessary tools are available, including water, HEPA vacuum, lined dumpster.
- 4) After satisfactory visual inspection by the Safety Officer, IRSE will begin transite removal.
- 5) Transite removal will be conducted using methods described in the IRSE Hazardous Material Contractor Quality Control Plan.

5.5.3 Removal of all other Class II Materials

- 1) The workers will don appropriate PPE as described in Section 5.4.
- 2) IRSE will perform setup of the work area as described in Section 5.2.3(7).
- 3) IRSE will notify the on-site Safety Officer prior to beginning removal so that visual inspections can be conducted to insure that all necessary tools are available, including water, HEPA vacuum, lined dumpster.
- 4) After satisfactory visual inspection by the Safety Officer, IRSE will begin removal of specific materials, as identified in Appendix D.
- 5) Class II removal will be conducted using methods described in the IRSE Hazardous Material Contractor Quality Control Plan.

5.5.4 Final Visual Inspection of Work Area

- 1) Following an acceptable visual inspection by the CWC Site Safety Officer after asbestos removal from each asbestos removal work area, IRSE will apply an encapsulant to all surfaces in the work area and clearance sampling can be collected for analysis.
- 2) All abated areas will be inspected by the Contractor, CWC Onsite Supervisor and IRSE supervisor. Upon successful inspection, each will sign the completed form "Final Inspection Report" Form. The Form can be found at the end of Attachment C: Forms.

5.6 Removal of Lead Dust from Buildings

- 1) IRSE will conduct the construction activities described herein in accordance with all currently applicable federal, state, and local laws and regulations including, but not limited to, Title 29 CFR 1019.10025.

5.6.1 Vacuuming Lead dust in Building

- 1) The workers will don appropriate PPE as stated in Section 5.4 and IRSE Hazardous Material Quality Control Plan.
- 2) IRSE will then perform setup of the "Lead Removal Work Area" as stated in Section 5.2.4. (1), including installing critical barriers.
- 3) IRSE will also install a two stage decontamination unit as stated in Section 5.3. The decontamination unit will be placed at the doorway leading into the building or at a central area on site.
- 4) Once the decontamination unit and all critical seals have been installed, the IRSE Competent Person will perform a visual inspection of the work area to ensure that all critical seals are in place and that adequate negative pressure has been established, if applies.
- 4) All abated areas will be inspected by the Contractor, CWC Onsite Supervisor and IRSE supervisor. Upon successful inspection, each will sign the completed form "Final Inspection Report" Form. The Form can be found at the end of Attachment C: Forms.

6.0 Waste Handling and Disposal

6.1 Packaging and Storage of Waste and Removal from the Work Area

- 1) The friable ACMs that will be removed from the project site and are judged by a competent person to be friable (i.e., those ACMs that, when dry, can be crushed, crumbled, pulverized, or otherwise rendered to a dust by hand pressure) will be packaged and stored in a manner prescribed herein for disposal as hazardous waste.
- 2) Friable asbestos waste shall be placed in two layers of 6-mil polyethylene disposal bags.
- 3) All friable asbestos waste (bagged) will exit the work area through the equipment room of the decontamination unit or from a separate waste load out decontamination unit. These waste load out units will be contiguous to the work area containment.
- 4) The personnel loading the asbestos-containing waste will be protected by disposable clothing and, at a minimum, half-facepiece air-purifying dual-cartridge respirators equipped with high efficiency filters.
- 5) The bagged or wrapped asbestos waste shall be properly labeled and placed in locked storage containers. At a minimum, the outside of each waste bag or package containing asbestos hazardous waste will be labeled as described in 6.2(5).

6.2 Packaging and Storage of Nonfriable Waste and Removal from the Work Area

- 1) The nonfriable ACMs that will be removed from the project site and are judged by a competent person to be nonfriable (i.e., those ACMs that, when dry, cannot be crushed, crumbled, pulverized, or otherwise rendered to a dust by hand pressure) will be packaged and stored in a manner prescribed herein for disposal as hazardous waste.
- 2) Nonfriable asbestos waste will be loaded directly into a mega boxes, (Gaylord boxes) place in disposal bags and doubled bagged or double wrapped with 6 mil poly.
- 3) The personnel loading the asbestos-containing waste will be protected by disposable clothing and, at a minimum, half-facepiece air-purifying dual-cartridge respirators equipped with high efficiency filters.
- 5) The wrapped asbestos waste shall be properly labeled and placed in locked storage containers. At a minimum, the outside of each package containing asbestos hazardous waste will be labeled as follows:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
HAZARDOUS WASTE
STATE AND FEDERAL LAW
PROHIBITS IMPROPER DISPOSAL
IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY
AUTHORITY OF THE WASHINGTON DEPARTMENT OF
TOXIC SUBSTANCES CONTROL

Generator's Name _____

Address _____

Manifest _____

RQ, Asbestos, 9, NA2212, III

- 6) The asbestos disposal containers (e.g., bags, wraps and boxes) and storage areas shall be secured and placarded with appropriate warning signage

6.3 Transportation and Disposal

- 1) The disposal of waste that contains asbestos waste and lead waste will stay onsite and be placed in a storage area designated by the General Contractor.

7.0 Air Monitoring Sampling

7.1 Personal Air Monitoring – Asbestos

- 1) IRSE's Competent Person will be conducting personal air monitoring on workers involved in the project. Personal air monitoring for asbestos will be conducted in accordance with Title 29 CFR 1926.1101. The IRSE Competent Person shall use the personal air monitoring results to evaluate the effectiveness of engineering controls and the adequacy of PPE and to determine whether the appropriate work practices are being utilized.
- 2) Personal exposure monitoring for asbestos shall be conducted utilizing single-use standard 25-mm-diameter, 0.8 -micron pore size, MCE membrane filters and cassettes with nonconductive cowlings ("barrels") and shrink bands. Air samples for asbestos concentrations will be analyzed by PCM Method 7400/7402.
- 3) The Contractor's workers shall not be exposed to an airborne fiber concentration in excess of 1.0 fiber per cubic centimeter (f/cc) as averaged over a sampling period of 30 minutes nor in excess of 0.1f/cc as expressed as an 8-hour TWA.
- 4) The Contractor will post the results of daily personal air monitoring at the job site.

7.2 Pre-abatement, Area and Perimeter Sampling – Asbestos

- 1) Except as otherwise noted, environmental sampling for airborne asbestos shall be conducted utilizing single-use, standard 25-millimeter-diameter, 0.8-micron pore size, mixed MCE membrane filters and cassettes with nonconductive cowlings ("barrels") and shrink bands. Air samples for asbestos concentrations will be analyzed by PM Method 7400.
- 2) IRSE Competent Person shall conduct daily environmental air sampling for airborne fiber concentrations outside the regulated asbestos work areas. A minimum of two samples will be collected outside each Class I negative pressure enclosure abatement activities.
- 3) Pre-abatement (baseline or background) air sampling will also be conducted by IRSE's supervisor. These samples will be collected in general accordance with 29 CFR 1926.1101, although the number of samples collected per location will vary. Air samples for baseline asbestos fiber concentrations will be analyzed by PCM Method 7400. Pre-abatement air samples will be collected by "nonaggressive" methods.

7.3 Final Cleaning, Clearance Sampling Methodology and Analysis – Asbestos

- 1) Visual inspections and air clearance sampling of each work area shall be conducted by an independent contractor hired by the owner/general contractor. Following the completion of asbestos abatement and final detail cleaning in each work area. The cleaning phase will include misting the air with amended water to reduce airborne fiber concentrations. The cleaning process shall also include vacuuming with HEPA-equipped vacuums and wet wiping. Horizontal surfaces within the area shall be cleaned of all visible asbestos debris using a HEPA vacuum and wet wiped.

If a visual inspection reveals residual three-dimensional debris, IRSE will abate the debris, detail clean the area of the debris, and repeat the HEPA vacuum and wet wiping process.

Once the recleaning process is complete, the work area shall be subject to another visual inspection for the presence of residual three-dimensional debris.

- 2) Satisfactory completion of this visual inspection will be followed by the encapsulation of the substrates and/or systems from which the ACM was removed. Following a suitable period of time to allow the encapsulant to dry, final air clearance samples will be collected. Clearance air samples will be collected using the methods described herein. Negative pressure equipment (NPE), if applicable, will continue in operation until satisfactory clearance air sample results are achieved. Failure to achieve satisfactory air clearance results will result in IRSE repeating the final cleaning process and the subsequent collection of additional clearance air samples.
- 3) Collection and analysis of clearance air sample monitoring for asbestos hazard abatement will be an independent industrial hygiene provider under contract with the owner/general contractor. Collection and analysis of clearance work areas after the ACM hazard has been abated and the work area has passed a visual clearance
- 4) Five or more samples will be collected within each containment. Clearance air samples indicating airborne fiber concentrations within the requirements of AHERA Guidelines for asbestos response action activities in schools will be received, and written permission from Northern Industrial Hygiene will be obtained before releasing IRSE to demobilize the work area.
- 5) Once a work area has been abated of ACM hazards, satisfactory final air clearance testing has been concluded and written permission from Northern Industrial Hygiene has been obtained, any remaining layers of polyethylene sheeting shall be removed and disposed of as asbestos waste

7.4 Personnel Air Monitoring – Lead

- 1) IRSE's Competent Person Supervisor will be conducting personal air monitoring on workers involved in the project. Personal air monitoring for lead will be conducted in accordance with Title 29 CFR 1926.62. The IRSE Supervisor shall use the personal air monitoring results to evaluate the effectiveness of engineering controls and the adequacy of PPE and to determine whether the appropriate work practices are being utilized. 2) Personal exposure monitoring for lead shall be conducted utilizing single-use standard 37-mm-diameter, 0.8 -micron pore size, MCEF membrane filters and cassettes with nonconductive cowlings ("barrels").
- 3) The Contractor's workers shall not be exposed to airborne lead in concentrations over $15\mu\text{g}/\text{m}^3$ (half of the action level) as expressed as an 8-hour TWA. If airborne concentrations of lead in the breathing zone of any individual employee reaches $10\mu\text{g}/\text{m}^3$, work will stop and the Northern Management Services Project Manager will be notified. Engineering controls will be re-evaluated and additional engineering controls will be implemented before work resumes.

- 4) The Contractor will post the results of daily personal air monitoring at the job site within 72 hours of air sample collection.

7.5 Area and Perimeter Sampling - Lead

- 1) The IRSE Supervisor shall use the personal air monitoring results to evaluate the effectiveness of engineering controls and the adequacy of PPE and to determine whether the appropriate work practices are being utilized.
- 2) Monitoring for lead shall be conducted utilizing single-use standard 37-mm-diameter, 0.8-micron pore size, MCEF membrane filters and cassettes with nonconductive cowlings ("barrels").
- 4) IRSE's Supervisor will collect air samples prior (baseline or background) to LBP removal. These samples will be collected for information and documentation only, and are not required by contract documents or regulation.

8.0 Laboratory Analysis of Personal Air Samples

- 1) All personal and OWA air samples will be analyzed at Mountain Labs, Inc.. This lab is an American Industrial Hygiene Association (AIHA) and an EPA National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory.
- 2) All air samples for asbestos concentration will be analyzed by PCM Method 7400/7402.

Appendices

- A Supervisor Qualifications**
- B Site Specific Hazard Analysis**
- C ACM Removal Procedures**
- D Fall Protection Plan**
- E Permits/Notifications**
- F Material and Equipment Data**
- G Air Monitoring Plan/Sample Results**
- H Respirator Protection Program/Medical Clearance Documentation**
- I Drawings/Site Layout**
- J Laboratory Certifications**
- K Material Safety Data Sheet**

Appendix A

Supervisor Qualifications

MARK KAZEMBA
Supervisor

FIRM AFFILIATION— Mark is a full time employee at IRS Environmental

YEARS OF RELEVANT EXPERIENCE— 20 years in asbestos abatement field.

ACTIVE REGISTRATIONS	ACTIVE REGISTRATIONS (CONTINUED)
AHERA-Certified Asbestos Supervisor	Professional
EPA-Certified Asbestos Supervisor	HAZMAT Certified – 40 hour
Crane and Rigging	CPR / First Aid
Cutting and Welding safety certified.	

SPECIFIC QUALIFICATIONS,

Mr. Kazemba has been employed by IRS Environmental since 2005. His relevant project experience since 1987 includes hazardous materials abatement projects supervised at University of Washington, University of Idaho, and University of Montana. These hazard control activities include asbestos and lead painted building component removal, handling of PCB containing lighting ballasts, mercury lamps, and universal hazardous wastes. Mark Also has five years of home building experience prior to his asbestos abatement career.

RELEVANT PROJECT EXPERIENCE

Mr. Kazemba experiences in specific evaluation criteria are shown in the table below. The project descriptions that follow are descriptions of projects requiring skills that are relevant to this project.

✓ Asbestos abatement	✓ Demolition	✓ Residential abatement
✓ Asbestos abatement in occupied commercial or public industry buildings, including college campus. Work experience includes University of Washington, University of Idaho, and university of Montana.	✓ Management and or Supervision of three asbestos abatement projects over \$ 300,000.00	✓ Dismantling of Lighting Fixtures including Handling, Storage and Disposal of Universal and Hazardous Wastes.
✓ Commercial/Industrial abatement	Cost tracking	Test pit/trench excavation
✓ Equipment decontamination	✓ Field documentation	WASTE MANAGEMENT (CONCOVER, COMPACTION, Waste treatment, transport, and/or management
✓ Excavation	Instrument installation	
✓ Decontamination or waste mgmt of contaminated tangible property	✓ Lead-based paint abatement Monitoring well installation	
✓ Debris removal	✓ Public relations	UST removal, closure, replacement

University of Idaho—On site supervisor for project involving abatement of thermal system insulation, vinyl asbestos floor tile, spray applied fireproofing, lead related demolition work, PCB Light Ballast Handling, and Lab Sinks.

Fairchild Air Force Base — On site supervisor during selective demolition activities and asbestos removal activities.

The Postal Annex- On site supervisor during removal of PCB Ballasts, 190,000 SF vinyl asbestos floor tile and asbestos mastic, 120,000 SF of asbestos containing browncoat ceiling texture and 1,000 LF of asbestos thermal system insulation.

Libby Soil Remediation - On site supervisor during clean up of vermiculite contaminated soil project. Removed and replaced 6-10 Inches of soil on multiple residential sites.

Kaiser Aluminum — On site supervisor during removal of thermal system insulation and fire proofing insulation in the soaking pits and batch ovens. Selective demolition of refractory walls and floors to access asbestos materials. Cleaned and abated batch ovens and removed thermal insulation from piping using glove bag procedures.

Asarco Plant, Helena, MT - On Site Supervisor during heavy metal dust contamination clean up and removal of 170,000 SF of Galbestos siding, 80,000 SF of Transite siding and roofing panels and 2,000 SF of vinyl asbestos tile and associated mastic.



J Tech, Inc.
Industrial Hygiene Services

CERTIFICATE OF TRAINING

THIS IS TO CERTIFY THAT

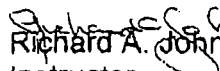
MARK KAZEMBA, XXX-XX-8319

HAS COMPLETED 8 HOURS OF REFRESHER TRAINING IN
HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

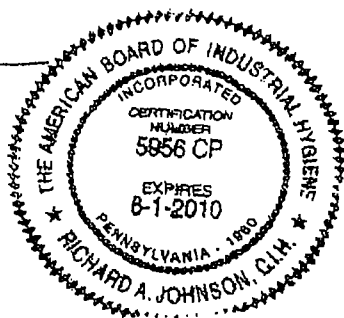
ACCORDING TO THE REQUIREMENTS OF 29 CFR 1910.120
AND CHAPTER 296-843-20010, WASHINGTON ADMINISTRATIVE CODE

Training Period 3 March 2007

Expiration Date 3 March 2008


Richard A. Johnson, CIH
Instructor

Certificate Number 7-0010.18-11





Occupational Medicine
Associates

Paula A. Lantsberger, MD MPH
Terrence D. Rempel, MD 57, 503
Royce F. Van Gerpen, MD A500423

323 East Second Avenue
Spokane, WA 99202

509.455.5555
509.455.4114 FAX

MARK C. KAZEMBA

ITS ENV

REMOVED

003 CSR

04/12/06

06/02/60

45 M

1213

ASBESTOS CLEARANCE

Name: Mark Kazemba

Date Examined: 6-12-06

Results: There are no detected health conditions that would place this employee at an increased risk of material health impairment from exposure to asbestos:

☒ Yes

☐ No

Limitations: Recommended restrictions on this employee or upon the use of personal protective equipment: None

Physician's statements: I have informed this employee of the results of the medical exam and of any medical conditions resulting from asbestos exposure that require further explanation or treatment.

☒ I have also informed this employee of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.

Physician signature: Paula A. Lantsberger, Terrence D. Rempel, Royce F. Van Gerpen

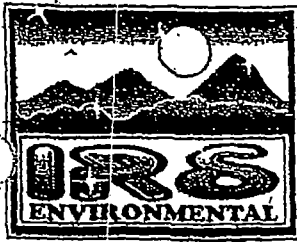
Examination: Height: 73 Weight: 201 B/P: 122/80 Pulse: 68

	<u>Normal</u>	<u>Abnormal</u>	
Ears:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TMs intact
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Canals clear
Mouth:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Clear / no obstruction
Neck:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Supple / no masses
Lungs:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Clear A + P
Heart:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Regular Rate / no murmur
Abdomen:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No mass / no organomegaly
Lymphatics:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	No lymphadenopathy

Adx + 1 eq

PFTs: ☐ Normal ☐ Abnormal ☐ Unacceptable ☐ No change

CXR: ☒ Normal ☐ Abnormal ☐ Unacceptable ☒ No change



WASHINGTON-OREGON-IDAHO-MONTANA
E. 12415 TRENT AVE.*SPOKANE, WA 99216
(509) 927-7867 FAX 928-3933

ASBESTOS*LEAD
ENVIRONMENTAL
SERVICES

IRS ENVIRONMENTAL OF WA, INC
CERTIFICATION OF WORKER'S ACKNOWLEDGMENT

*** WORKING WITH ASBESTOS CAN BE DANGEROUS
*** INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPE OF CANCER
*** IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS *
GREATER THAN THAT OF THE NON-SMOKING PUBLIC

IRS ENVIRONMENTAL requires that:

- * You be supplied with the proper respirator and be trained in its use.
- * You be trained in safe work practices and in the use of the equipment found on the job.
- * You receive a medical examination.

These things have been done at no cost to you. By signing this certification you are acknowledging the fact that IRS Environmental (your employer) has met these obligations to you.

RESPIRATORY PROTECTION: I have been trained in the proper use of respirators, and informed of the type of respirator to be used on IRS Environmental asbestos and lead removal projects. I have a copy of the written respiratory protection manual issued by my employer. I have been equipped at no cost with the respirator to be used on this project.

TRAINING COURSE: I have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. The topics covered in the course include the following:

Physical characteristics of asbestos
Health hazards associated with asbestos
Respiratory protection
Use of protective equipment
Negative air systems
Work practices including hands on or on-job training
Personal decontamination procedures
Air monitoring, personal and area

this certifies that

Mark Kazemba

has completed the Responder I
Course for First Aid and CPR

Course Date 3-2-06

Expiration Date 3-2-08

Instructor Mark Kazemba

MEDICAL EXAMINATION: I have had a medical examination within the past 12 months, which was paid for by IRS Environmental or my previous employer. This examination included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

Mark Kazemba
Employee Signature

3-22-08
Date

CERTIFIED AS PROVIDED BY LAW AS

ASBESTOS SUPERVISOR
CERTIFICATE NUMBER: 2007008081A
EXPIRATION DATE: 09/16/2007

KAZEMBA, MARK C.
E 24714 SAN CARLOS
NEWMAN LAKE, WA 99025

Signature Mark Kazemba
Issued by DEPARTMENT OF LABOR AND INDUSTRIES

MARK C KAZEMBA	
has met the requirements of Title 17, Chapter 74.3, Subchapter 3, of the Administrative Rules of Montana for accreditation in the following asbestos-type occupation(s) as indicated by an expiration date(s).	
CS	IN
09/16/2007	
WK	
MTA-2317	
MT DEQ Asbestos Control Program	



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ASBESTOS*LEAD
ENVIRONMENTAL
SERVICES

QUALITATIVE FIT TEST RECORD

Name: Mark Kazemba

Issue Date: 2-27-07

Soc. Sec. No.: 471-84-8319

Expiration Date: 2-27-08

Test Operator: Jack Wirth

TYPE OF QUALITATIVE FIT TEST: IRRITANT SMOKE

RESPIRATOR

Respirator brand: North

NIOSH Approval #: TC-21C-152

Model: 7700

Wear at least 10 minutes: 14.5

Size: Small
Med.
Lrg.

+/- Pressure fit check: pass

TEST

Each exercise is performed for one minute

Normal Breathing-No talking

Deep breathing-be certain breaths are deep

Turn head side to side-Inhale on each side, do not bump
the respirator against shoulders

Move head up and down-Inhale when head is in full up position,
do not bump respirator against chest

Reading-with eyes closed, repeat slowly and clearly after the
conductor the "Rainbow Passage"

Jogging in place-Jog in place

Normal breathing-No talking

Pass	Fail
<u>✓</u>	<u> </u>
<u>✓</u>	<u> </u>
<u>✓</u>	<u> </u>
<u>✓</u>	<u> </u>
<u>✓</u>	<u> </u>
<u>✓</u>	<u> </u>
<u>✓</u>	<u> </u>

FINAL FIT: pass

Supervisor Signature: Jack Wirth

Employee Signature: Mark Kazemba

** Employee must have a current qualitative fit test before assigning them a task that requires a respirator to be worn.



CONT: REG. NO. IRENEW033BN

WASHINGTON-OREGON-IDAHO-MONTANA

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(509) 927-7867 FAX (509) 928-3933

ASBESTOS*LEAD
ENVIRONMENTAL
SERVICES

QUANTITATIVE FIT TEST RECORD



J TECH
Industrial Hygiene Services

CERTIFICATE OF FIT TESTING

J Tech Proudly Announces that

MARK KAZEIMBA XXX-XX-8319

has successfully completed Training and Fit Testing
for the following respirator according to Table 1h, Chapter
296-842-200 WAC Ambient Aerosol Condensation Nuclei
Counter (Portacount)

Full Face Piece NORTH Model 7600 Size M/L

EXP: 3/3/08

Appendix B

Site Specific Hazard Analysis



CONT. REG. NO. IRSEMV1033PN

WASHINGTON-OREGON-IDAHO-MONTANA

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(509) 927-7867 FAX (509) 928-3933

**ENVIRONMENTAL
SERVICES**

ACTIVITY HAZARD ANALYSIS

Activity: Remove Asbestos CAB Siding, Floor Coverings, Gasket Materials, Pipe Covering, Mastics, Adhesives, roofing and Window Removal.	Date: April 17, 2007 Project: ASARCO Phase 4 Building Cleaning and Demolition
Description of the work: Install negative pressure enclosure. Remove Asbestos flooring with substrate, CAB Siding and roofing, pipe covering, gaskets, adhesives from floor, roofing materials, metal sidings and roofing and window caulking. Final clean for clearance sampling, visual and air samples and ready building	Site Supervisor: MARK KAZEMBA Site Safety Officer: _____ Review for latest use: Before the Job is performed.

Work Activity Sequence (Identify the principal steps involved and the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
General Conditions	Noise	Wear hearing protection during the operation of Industrial Hurricane HEPA VAC., Compressor and HEPA Vacuums. Also when working in close proximity of motorized equipment used by all trades in general work area. <ul style="list-style-type: none"> Hearing protection will be worn while using power tools (ex. Skill saw, sawzall)
General Conditions General Conditions, Continued	Hand Tools Hand Tools Continued	<ul style="list-style-type: none"> Tools shall be inspected prior to use and damaged tools will be tagged and removed from service. Hand tools will be used for their intended use and operated in accordance with industry standards; All power tools equipped with a safety guard of any type shall be used only with the guard in place and functioning properly. Portable power tools will be plugged into GFCI protected outlets; and Portable power tools will be Underwriters Laboratories (UL) listed and have a three-wire grounded plug or be double insulated. Tools shall be used only for their intended purpose. All power tools shall be unplugged (electric), de-energized (battery), unhooked from air supply (pneumatic) or pressure

Work Activity Sequence (Identify the principal steps involved in the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Preparation of plastic enclosure, working in plastic enclosure	Fire hazard	<ul style="list-style-type: none"> • Insure ABC fire extinguishers are in place in every work area. One fire extinguisher for every 2,000 SF of work area per floor. • Insure all workers are properly trained in use of fire extinguishers. • NO SMOKING IS ALLOWED ON SITE IN ANY AREA!
Mastic removal in enclosed work area	Fire and explosion	<ul style="list-style-type: none"> • Discuss MSDS for mastic removal solvents with each worker • Work area will be fresh-air ventilated with a minimum of 12 air changes per hour. • PPE will be provided by IRS and worn, to include: Safety Glasses, ½ face respirators with appropriate cartridges, disposable polypropylene coveralls, nitrile rubber gloves and boot coverings. • All heat and ignition sources will be eliminated. NO SMOKING IS ALLOWED ON SITE IN ANY AREA!
Preparation for Asbestos Removal VAT Removal	Slips, trips and falls due to cords, hoses, wet working conditions.	<ul style="list-style-type: none"> • Maintain housekeeping at all times to prevent tripping hazards • Work areas will be visually inspected and slip and trip hazards will be marked, barricaded or eliminated. • Proper illumination will be maintained in all work areas. • Warning! – Wet plastic floors are slippery. Maintain guardrails on all rolling scaffold, wear non-slip boots! • Warning! Piles of VAT are extremely slippery, like shale rock. Clean up VAT immediately and place in disposal container. Do not allow large accumulations of VAT on floor. DO NOT stand on VAT piles!
Asbestos VAT removal, placing VAT waste in containers and disposal process.	Strains/Lifting hazards – Heavy disposal bags, vacuum hoses, tools.	<ul style="list-style-type: none"> • 1. Get as close to the load as possible. • 2. Avoid picking up heavy objects placed below your knees. • 3. Keep your back straight when reaching to lift an object. Tighten your stomach muscles to keep your spine from twisting while lifting a load. • 4. Bend with your knees not your back. • Stretch and loosen up before work. • Change direction by moving your feet not your hips. Look ahead to make sure the path is clear. • Remember steps 1-4 above when putting load down or stacking.
Cement asbestos Board (CAB), metal siding and roofing removal	Strains/Lifting hazards – Heavy disposal bags, vacuum hoses, tools	<ul style="list-style-type: none"> • 1. Get as close to the load as possible. • 2. Avoid picking up heavy objects placed below your knees. • 3. Keep your back straight when reaching to lift an object. Tighten your stomach muscles to keep your spine from twisting while lifting a load.

Work Activity Sequence Identify the principal steps involved in the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Cement Asbestos Board (CAB), metal siding and roofing removal - Continued		<ul style="list-style-type: none"> • 4. Bend with your knees not your back. • Stretch and loosen up before work. • Change direction by moving your feet not your hips. Look ahead to make sure the path is clear. • Remember steps 1-4 above when putting load down or stacking • 100% Fall protection will be required for work on the roof covered under this AHA, whether it be full guardrail systems or personal fall arrest systems. Refer to the fall protection plans for details. • In general, on roof bays, personal fall arrest systems with adequate anchorage is required if guardrail system is in place. • Ensure that areas of suspect integrity are adequately marked and barricaded to ensure no possibility that personnel or equipment cannot fall through the roof
Rolled Roofing Removal		<ul style="list-style-type: none"> • 100% Fall protection will be required for work on the roof covered under this AHA, whether it be full guardrail systems or personal fall arrest systems. Refer to the fall protection plans for details. • In general, on roof bays, personal fall arrest systems with adequate anchorage is required if guardrail system is in place. • Ensure that areas of suspect integrity are adequately marked and barricaded to ensure no possibility that personnel or equipment cannot fall through the roof
Man Lift Operation	<p>Operation Hazards</p> <p>Operators must "NOT"</p>	<ul style="list-style-type: none"> • Manlift(s) shall not be used above personnel on the ground or working on the roof. • Read and understand the operating instructions and safety rules for the equipment being used. • Understand all decals, warnings and instructions displayed on the work platform • Inspect for defects that would affect a lift's safe operation. Be alert for cracked welds or other structural defects, leaks in hydraulics, damaged control cables, loose wires, or bad tires. • Test the controls to make sure they work. • Check the operating condition of the brakes, lights and other automotive-operating accessories, such as horns and warning devices. • Use ladders or makeshift devices on the platform so workers can reach higher. • Climb up or down extendable arms. • Sit on or climb on the edge of the basket. • Delay reporting any defects or malfunctions to the supervisor.

Work Activity Sequence (Identify the principal steps involved in the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
		<ul style="list-style-type: none"> Engage in stunt driving or horseplay.
Overhead demolition		<ul style="list-style-type: none"> Manlift(s) shall not be used above personnel on the ground or working on the roof. Hard hats will be required for all overhead demolition work. Barricade overhead demolition zones as needed.
Generators.	Fire hazards	<ul style="list-style-type: none"> Fuel equipment <u>prior</u> to use each day, while equipment is cool. Only refuel equipment after the engine has been allowed to cool. Clean up spilled gas immediately. Ensure that gas caps are tight after refueling and periodically during operation. ABC Fire extinguishers will be staged in close proximity to all tools and equipment that are being used and in refueling areas. Sources of ignition are prohibited in areas where equipment is being refueled.
Generators	Electrical hazards	<ul style="list-style-type: none"> Ensure that generators are adequately grounded to the frame of the device. Ensure that generators are equipped with Ground Fault Circuit Interrupters (GFCI) and that they are tested prior to use. Inspect electrical cords prior to use and remove damaged cords from service. Inspect grounded tools to ensure that the ground prong is in place and that three wire grounded temporary cords are used for these devices. Double insulated tools do not require a third wire grounding conductor.
Regulated asbestos work area – containment.	Asbestos hazard	<ul style="list-style-type: none"> Install signs and barrier tape to create regulated work area prior to any Asbestos removal activities. See asbestos removal work plan. Install multiple layers of 6ml floor below asbestos fireproofing removal area prior to beginning removal. Install multiple layers of 6ml wall covering in area where asbestos fireproofing removal is to occur prior to beginning removal. Install and test negative pressure enclosure and decontamination facilities prior to beginning activities which will disturb asbestos fire proofing or VAT and mastic removal. Only trained and certified workers will be allowed in asbestos regulated work areas. All workers will enter and leave regulated work area through designated decontamination area. Housekeeping shall be a priority. Use installed drop sheets to

Work Activity Sequence (Identify the principal steps involved in the sequence of work activities)	Potential Health and Safety Hazards (Analyze each principal step for potential hazards)	Hazard Controls (Develop specific controls for each potential hazard)
Regulated asbestos work area – containment (continued)		<p>aid prompt clean up.</p> <ul style="list-style-type: none"> • Absolutely no debris will be allowed to accumulate in work areas. • Workers will decontaminate using shower prior to exiting the work area. • All waste will be wrapped or packaged in 6ml plastic immediately. • All packaged waste will be stored in designated covered and locked storage container by end of each work shift. • All workers will wear proper PPE to include ½ face air purifying respirators (VAT and mastic) , or full faced Type C Respirators (Asbestos fireproofing) full disposable coveralls in addition to on site standard PPE.
Detail Cleanup	HEPA VAC	<ul style="list-style-type: none"> • Wear hearing protection during use

Equipment to be used (List equipment to be used in the work activity)	Inspection Requirements (List inspection requirements for the work activity)	Training Requirements (List training requirements including hazard communication)
Detail Clean up (cont.)	Check bags and filters daily or as needed. Check filters daily and remove debris	<ul style="list-style-type: none"> • Use by trained personnel only. • Hearing Protection Program. ear plugs required.
Hand tools (pry bars, hammers, manual scrapers)	Check handles and tool condition daily	<ul style="list-style-type: none"> • Training on proper use. • Eye Protection.
Sawzall, Circular Skilsaw.	Daily inspection	<ul style="list-style-type: none"> • Training on proper use. • Eye Protection
Main lift	Daily inspection	<ul style="list-style-type: none"> • Inspect for defects that would affect a lift's safe operation. Be alert for cracked welds or other structural defects, leaks in hydraulics, damaged control cables, loose wires, or bad tires. • Test the controls to make sure they work. • Check the operating condition of the brakes, lights and other automotive-operating accessories, such as horns and warning devices.

ACTIVITY HAZARD ANALYSIS

PRINT

SIGNATURE

Supervisor Name: _____

Date/Time: _____

Safety Officer Name: _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

ACTIVITY HAZARD ANALYSIS (Continued)

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Employee Name(s): _____

Date/Time: _____

Appendix C

ACM Removal Procedures

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Decontamination procedures for a full negative pressure enclosure

NOTE: *OSHA 1926.65 requires all employees, visitors, and emergency response personnel to receive instructions from a designated company representative before entering areas where hazardous waste operations are being conducted.*

ENTER:

1. Enter the decontamination area through the clean room.
2. Remove street clothing and jewelry and place into assigned lockers.
Check Respirator for defects and replace as needed.
3. DO NOT apply cosmetics, eat, drink, smoke, chew gum or tobacco once inside the decontamination area or work area.
4. Put on PPE (i.e., coveralls, respirator, boot covers, gloves)
5. Check respirator using positive/negative pressure test.
6. Pass through airlock doorways to shower area, equipment area and into the work area.

EXIT:

1. Remove PPE (**EXCEPT RESPIRATOR**) in the equipment room. The equipment room is designated for this purpose, with containers for used PPE. This area should be kept organized and free of asbestos and asbestos contaminated materials at all times.
2. Re-usable PPE such as boots, hard hats, safety glasses, can be cleaned and left inside the equipment room to be used upon re-entry to the work area. These items must be completely cleaned in the equipment room and in the shower if they are to be removed from the work area.
3. Proceed to the shower still wearing respirator. Wash body and respirator completely. Discard used water soaked respirator cartridges by reaching through the airlock, back into the equipment room and dropping them into the waste container provided.
4. Pass through the last air-lock and into the clean room. Dry off, and re-dress. Disinfect/clean your respirator using procedures covered in IRSE respirator protection program.

NOTE: IRSE requires strict adherence to the guidelines established by OSHA, and the EPA. Eating, drinking, smoking, chewing gum or tobacco or removing respirators inside a known regulated area is grounds for immediate dismissal.

Employee or visitors signature _____ Date _____

Designated IRSE decontamination representative _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Min enclosure Decontamination Procedures for use during Glove Bag Removal

A clean room will be established at the entrance to each mini enclosure constructed for glove bag removal work. The clean room will be constructed of 2 layers of 6 ml poly over wood frame. A HEPA vacuum will be used to remove asbestos contamination from the workers work suits before they leave the work area.

ENTRY

Workers will don two pairs of disposable coveralls over their street clothes and the appropriate respirator. Respirator fit will be checked using positive/negative pressure test. Next, workers will pass through the clean room into the mini enclosure to begin the glove bag and cut and wrap work.

EXIT

Worker will remove outer layer of coverall and place in an asbestos disposal bag, then immediately enter the clean room and remove the asbestos contamination from the inner tyvek coverall using a HEPA vacuum. After a thorough HEPA cleaning, the worker may remove the inner tyvek coverall, and proceed to the three stage decontamination center with shower for secondary decontamination.

NOTE: OSHA 1926.65 requires all employees, visitors, and emergency response personnel to receive instructions from a designated company representative before entering areas where hazardous waste operations are being conducted.

Employee or visitors signature _____ Date _____

Designated IRSE decontamination representative _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Preparation of work area for Class One Asbestos Removal

PRE-WORK SAFETY REQUIREMENTS:

1. Review at initial safety meeting: IRSE MSDS for spray adhesives.
2. Review at initial safety meeting: Emphasize the importance of ventilating the work area to reduce exposure to vapors while using spray glue.
3. Lock out / Tag out all HVAC and un used circuits within work area before beginning work.

PERSONAL PROTECTIVE EQUIPMENT:

1. 1/2 face air purifying respirator with HEPA (purple) filters if friable damaged asbestos is encountered during work area preparation.
2. Disposable coveralls if friable damaged asbestos is encountered during work area preparation.
3. Safety glasses.

PROPER PREPARATION STEPS:

1. Seal all critical barriers at work area perimeter with double layer of 6ml poly.
2. Lock out / tag out HVAC system and un-used circuits in work area.
3. Seal all critical HVAC openings with double layer of 6ml poly.
4. Install 6ml poly floors and walls. All horizontal and vertical surfaces will be covered within the work area.
5. Cover all objects within the work area with 6ml poly secured with duct tape.
6. Install second layer of 6ml poly drop sheets over all surfaces.
7. *Install adequate Air Filtration Devices to insure 6 air changes per hour or more.* Install the Air Filtration Devices in a manner which directs the airflow away from the breathing zone of the workers.
8. Allow Air Filtration Devices to run continuously for one to two hours before removal begins to insure integrity of circuits.
9. Install a Two Stage decontaminating decon, the crew will remote to a Three Stage Decon

Employees signature _____ Date _____

Supervisors signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Preparation of work area for class one thermal system insulation materials removal using cut and wrap / glove bag removal methods

PRE-WORK SAFETY REQUIREMENTS:

1. Review at initial safety meeting: IRSE MSDS for spray adhesives.
2. Review at initial safety meeting: Emphasize the importance of ventilating the work area to reduce exposure to vapors while using spray glue.

PERSONAL PROTECTIVE EQUIPMENT:

1. 1/2 face air purifying respirator purple and black filter cartridges. While using spray glue.
2. Safety glasses.

PROPER PREPARATION STEPS:

1. Post 3" DANGER ASBESTOS barrier tape at work area perimeter to restrict access of untrained personnel
2. Seal all critical barriers at work area perimeter with double layer of 6ml poly.
3. Install 6ml poly floors under thermal system insulation to be removed.
4. *Install adequate Air Filtration Devices to insure 6 air changes per hour or more.* Install the Air Filtration Devices in a manner which directs the airflow away from the breathing zone of the workers.
5. Allow Air Filtration Devices to run continuously for one to two hours before removal begins to insure integrity of circuits.
6. Install "Danger Asbestos" Signs at work area entrance.
7. Install Three Stage decontamination center and two stage waste load out before removal begins.

Employees signature _____ Date _____

Supervisors signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

VCI Removal

This activity involves removal of a Class II building material. All other methods of compliance such as HEPA vacuums, wet methods, prompt clean up apply. Use of compressed air to remove ACM Materials is not allowed.

WORK AREA PREPARATION:

1. Review at initial safety meeting: each worker at initial safety meeting must complete IRSE Solvent Safety Checklist.
2. Review at initial safety meeting: Emphasize the importance of ventilating the work area to reduce fire hazard and exposure to vapors.

PERSONAL PROTECTIVE EQUIPMENT:

1. Disposable polypropylene or Tyvek coveralls.
2. Full Face Air Purifying Pressure Respirator.
3. Latex gloves.
4. Ear Plugs

REMOVAL PROCEDURES:

1. Prepare negative pressure enclosure/work area as per written procedures.
2. Pre wet the material before removal. Spray the material with a fine spray of amended water. Wet the material and allow the water to soak into the material until it is *wet enough to remove without causing visible emissions, but not so wet as to damage ceiling substrate below.*
3. Vacuum the material while damp and continue to spray with water as necessary to prevent visible emissions.
4. Remove gross contamination from tools and protective clothing before proceeding to the de-con chamber. Proceed to the equipment room and wash your tools and equipment. The tools and equipment must be cleaned or placed in clean bag prior to removal from work area.
5. Take containerized waste to the waste load-out. Wet wash /wipe the bag in the equipment room before passing it into a clean asbestos disposal bag held by a worker in the second clean room.
6. The second bag will be sealed immediately and placed in a locked covered secure storage dumpster or truck for transport and disposal.

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

VCI Removal

Employees signature _____ Date _____

Supervisor signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena, Montana

Trailer Mounted Vacuum Operation

PRE-WORK SAFETY REQUIREMENTS:

- 1) Review at initial safety meeting: IRS Environmental MSDS for material(s) being vacuumed.
- 2) Review at initial safety meeting: Emphasize the importance of working in pairs, proper use of pop-off valves, air horns, radio communication, ear protection, safety glass, confined space and fall protection plan.
- 3) Review at initial safety meeting: When performing the daily safety meeting, document where the mechanical relief valve is located at on the vacuum line and also who will be the monitor of the relief valve.

PERSONAL PROTECTION EQUIPMENT:

- 1) Half face air purifying respirator for interior cleaning and soil removal.
- 2) Full face powered air purifying respirator for attic space removal.
- 3) Hearing protection
 - a. Ear muffs and/or disposable ear plugs.
- 4) Hard hats
- 5) Safety glasses
- 6) Disposable polypropylene coveralls
- 7) Gloves
 - a. Leather style
 - b. Rubber

PROPER OPERATION STEPS:

- 1) Perform all maintenance checks
- 2) Ensure truck is on level and secure ground
- 3) Ensure that all body doors are closed
- 4) Properly connect vacuum hoses as required
- 5) Safe guards against dust explosions

VACUUM SAFETY:

- 1) When vacuuming around anything energized, examples (electrical, hydraulic, lock-out/tag out procedures will need to be performed.
- 2) Use gaskets at all times to ensure that there will be no water leaks or vacuum leaks.
- 3) Keep hands, clothing and feet away from the ends of the hose and pipes. Should you loose any items into the house; **DO NOT TRY TO RETRIEVE IT.** Allowing any body part to be pulled into the vacuum hose could be deadly.
- 4) Always follow confined space procedures when entering a confined area.
- 5) When working above the ground, you must follow the fall protection plan.
- 6) Do not operate vacuum truck RPM higher than what is needed to perform the job at hand; this could lead to damage of the vacuum hose and filters in the bag house.

- 7) Install in the vacuum line, a mechanical relief valve (pop-off valve). The mechanical relief valve will reduce and/or eliminate the possibility of an operator being injured by the vacuum hose, which could pull the operator or their loose clothing into the hose. The relief valve can be used in a 4 inch, 6 inch and 8 inch lines and will provide vacuum relief up to 27" of mercury.
- 8) When equipment is under vacuum pressure, the operator shall never leave person(s) handling the vacuum hose unattended.
- 9) Visual contact must always be present when possible between the operator and the person(s) handling the vacuum hose. When performing the daily safety meeting document what procedures will be used to maintain this contact.
- 10) If visual contact is not feasible, other methods will be used, an air horn system, two-way radio communications, a safety monitor and/or a hand held remote control system held by the person vacuuming. A person can press a switch and shut down the vacuum truck if there are any problems.
- 11) Any system used to notify the operator of the vacuum truck will be tested before work begins.

Supervisor's Signature _____ Date _____

Employee's Signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Boiler Flange Gasket Removal Method

This activity involves removal of a Class II building material. All methods of compliance such as HEPA vacuums, wet methods, prompt clean up apply. Use of compressed air to remove ACM Materials is not allowed.

PRE-WORK SAFETY REQUIREMENTS:

1. Review at initial safety meeting: IRSE power tool safety checklist. Review reciprocating saw safety features and requirements prior to operation.
2. Review at initial safety meeting: Operation of reciprocal saws requires safety glassed at all times during operation!!

PERSONAL PROTECTIVE EQUIPMENT:

The following personal protective equipment will be worn until a site-specific negative exposure assessment is obtained.

1. Disposable polypropylene coveralls.
2. 1/2 face air purifying respirator with HEPA cartridges.
3. Safety glasses.
4. Disposable cloth gloves

PROPER REMOVAL STEPS:

1. This work is to be completed inside an existing negative pressure mini enclosure installed for Class I removal of TSI.
2. Thoroughly pre-wet the gasket with amended water, and then scrape the gasket clean with a sharp putty knife.
3. Immediately place all waste in two layer 6ml disposal bags and place in a disposal dumpster, holding area or enclosed transportation van no later than the end of the work shift.

Employees signature _____ Date _____

Supervisors signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Class II Removal of Asphalt Asbestos Roofing, Mastic on rolled or Tab Roofing from Roof

PRE-WORK SAFETY REQUIREMENTS:

1. This work activity requires a site specific fall protection plan! Make sure one is on site before beginning roofing removal.
2. Review site specific fall protection plan before any removal begins at initial safety meeting. All workers new to the job site are required to review the fall protection plan and these work procedures before starting work.
3. Fall protection must be in place and inspected by IRSE Project Manger prior to working on roof.

PERSONAL PROTECTIVE EQUIPMENT:

1. Disposable polypropylene coveralls or
2. Cloth coveralls
3. 1/2 face air purifying respirator purple (HEPA) filter cartridges.
4. Safety glasses.
5. Disposable cloth gloves.

PROPER REMOVAL STEPS:

1. Lay 10 - 20 ft. drop sheet extending from base of structure to work area perimeter.
2. Install 2" "DANGER ASBESTOS" tape at work area perimeter to restrict access of non-certified trades.
3. Remove the material as intact as possible.
4. Roofing must be removed as **wet as is feasible**.
 - Use water carefully.
 - Using water on pitched roofs creates a slip and fall hazard, use only light wetting and follow all fall protection guidelines.
5. Control dust by using effective methods of lowering roofing debris to the disposal container.
 - A. Lower unbagged /unwrapped ACM immediately to the ground via dust tight chute never allow unbagged roofing to accumulate on the roof, or:
 - B. Bag or wrap ACM roofing in poly sheeting while it is on the roof. All bagged or wrapped waste must be in the waste disposal transportation container or cube van no later than the end of the workshift.
6. Unwrapped roofing must be placed in a lined, closed, covered dumpster or truck.

Employees signature _____ Date _____

Supervisors signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Class II Roof putty Sealant Removal

PRE-WORK SAFETY REQUIREMENTS:

1. *This work activity requires a site-specific fall protection plan!* Make sure one is on site before beginning roofing removal.
2. *Review site-specific fall protection plan before any removal begins* at initial safety meeting. All workers new to the job site are required to review the fall protection plan and these work procedures before starting work.

PERSONAL PROTECTIVE EQUIPMENT:

The following personal protective equipment will be worn until a negative exposure assessment can be made.

1. 1/2 face air purifying respirator.
2. Safety glasses.
3. Disposable cloth gloves.
4. Disposable cloth coveralls.

PROPER REMOVAL STEPS:

1. Keep putty moist during removal and demolition activities.
2. Keep putty intact during removal and demolition activities.
3. Wet and separate putty using manual methods after it is exposed.
4. Remove putty intact with the metal roofing, and wrap immediately or place in lined dumpster for storage and transportation.
5. If putty needs to be separated from metal roofing, use a flat sharp hand tool and place putty immediately into asbestos disposal bags.
5. All Bagged or wrapped waste must placed in locked disposal dumpster or enclosed transportation van no later than the end of the work shift.

Employees signature _____ Date _____

Supervisors signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena, Montana

Metalbestos Siding and Roofing Removal Methods

PRE-WORK SAFETY REQUIREMENTS:

1. Review at initial safety meeting: Cutting, abrading or sanding metalbestos panels is prohibited.
2. Review at initial safety meeting: Intentionally breaking metalbestos panels is prohibited.

PERSONAL PROTECTIVE EQUIPMENT:

1. Disposable polypropylene coveralls.
2. 1/2 face air purifying respirator.
3. Safety glasses.
4. Disposable cloth gloves.

PROPER REMOVAL STEPS:

1. Lay 10 - 20 ft. drop sheet extending from base of panel surface to work area perimeter.
2. Install 2" "DANGER ASBESTOS" tape at work area perimeter to restrict access of non-certified trades.
3. Wet each panel or shingle before removal.
4. Cut nails with flat sharp hand tool.
5. Carefully remove wet shingle or panel to minimize breakage
6. Immediately lower panels or shingles to the ground.
7. Immediately bag or wrap CAB in labeled 6ml poly sheeting. All bagged or wrapped waste must placed in locked disposal dumpster or enclosed transportation van no later than the end of the work shift.

Employees signature _____ Date _____

Supervisors signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena, Montana

Vacuum Lead Dust Cleaning from inside of the Blast Furnace Flue

PRE-WORK SAFETY REQUIREMENTS:

1. Review at safety meeting: Workers will not eat, drink, smoke, or apply cosmetics inside the lead control work area. These activities are prohibited until the employee has left the lead control work area, passed through the hygiene facility and washed thoroughly.
2. Review at safety meeting: No employee will be allowed to enter the demarcated area without attending a Lead in Construction class that meets the requirements of 29 CFR 1926.62 and WAC 296-62-054 through 05427.

WORK AREA PREPARATION:

1. All work under these procedures will take place within a demarcated lead control area. The boundaries of the work area will be clearly visible. 3" Barrier tape and caution signs will meet specifications called for in 29 CFR 1926.62.
2. Prepare work area by installing 6 ml drop sheets at the entrance to the work area.
3. Seal doors, install barriers to create negative pressure enclosure and prohibit migration of lead dust beyond lead control area.
4. Install Hygiene station for hand washing prior to meals, breaks, and leaving the work area.

PERSONAL PROTECTIVE EQUIPMENT:

1. Until exposure assessment determines worker exposure levels to be below the action level of 30ug/m3 (averaged over an eight hour period) all personnel performing scraping or brushing operations will wear the following personal protective equipment:
 - 1/2 face air purifying respirator
 - Tyvek coveralls
 - Safety goggles or glasses
 - Disposable cloth work gloves
 - Ear protection
2. When results of exposure assessment are below 15 ug/m3, workers will wear the following personal protective equipment:
 - Re-usable cloth coveralls.
 - Re-usable cloth gloves.
 - 1/2 face air purifying respirator.
 - Safety glasses or goggles

REMOVAL PROCEDURES:

1. Personal protective equipment, work boots, and disposable cloth coveralls will be vacuumed and left within the work area before proceeding to the **hygiene facilities** (hand and face wash station). Until exposure assessment indicates airborne lead concentrations below 30ug/m³, a thorough hand and face wash will be performed immediately following removal of protective clothing and upon leaving the lead control area.
2. A remote three stage decon will be provided for change area, its use is required. Storage areas for your street clothes will be provided.
3. The industrial vacuum will be used to clean up the lead dust through out the flue, IRSE employees will also use small brushes to remove the material from the interior top portion of the flue that is not reachable with the vacuum attachments.
4. In the unlikely event that airborne lead levels reach 1/2 of the action level(15ug/m³), all work will stop until work practices can be modified, and or engineering controls can be installed to reduce airborne lead levels.

In the unlikely event that airborne levels of lead exceed 30ug/m³ all effected employees will be required to participate in blood sampling and analysis for lead and zinc protoporphirin levels. Each employee receiving blood monitoring shall be notified of the results within five working days after IRS receives the results. (See IRS Medical surveillance program for lead removal, employee orientation)

5. Eight hour representative personnel sampling will be conducted for the task or tasks within the work area that generate the most airborne lead concentrations. All monitoring and analysis will be performed according to NIOSH Method 7082 or equivalent. All employees will be notified of the results of this analysis within five days of the exposure assessment. Exposure assessments will continue as conditions change throughout cleaning project.

CLEAN UP AND DISPOSAL PROCEDURES:

1. Clean up all lead dust debri by the end of each workshift. At no time will visible dust debris be tracked or allowed to migrate from the lead control work area.
2. Place all lead dust waste in labeled and designated disposal drum prior to the end of each workshift.
3. All drums must be dated, sealed, labeled and stored in the designated hazardous waste storage area.

Supervisor/Trainer_____

Date_____

Employee_____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Flange gasket and packing rope removal – furnace seals and joints and expansion joints,

This activity involves removal of a Class II building material. All methods of compliance such as HEPA vacuums, wet methods, prompt clean up apply. Use of compressed air to remove ACM Materials is not allowed.

PRE-WORK SAFETY REQUIREMENTS:

1. Review at initial safety meeting: IRSE power tool safety checklist. Review reciprocating saw safety features and requirements prior to operation.
2. Review at initial safety meeting: Operation of reciprocal saws requires safety glassed at all times during operation!!

PERSONAL PROTECTIVE EQUIPMENT:

The following personal protective equipment will be worn until a site specific negative exposure assessment is obtained.

1. Disposable polypropylene coveralls.
2. 1/2 face air purifying respirator with HEPA cartridges.
3. Safety glasses.
4. Disposable cloth gloves

PROPER REMOVAL STEPS:

1. Post 3" DANGER ASBESTOS barrier tape at work and DANGER ASBESTOS signs at all approaches and access points to the regulated work area to restrict access of untrained personnel
2. Set up a mini enclosure around the abatement area.
3. Wet any exposed lining or gasket material. Wrap tightly and securely with 6 ml poly and duct tape. Cut entire fitting or duct out by cutting pipe or on each side of fitting with reciprocating saw or band saw, leaving gasket in place and intact.
4. Immediately place all waste in two layer 6ml disposal bags and place in locked disposal dumpster, holding area or enclosed transportation van no later than the end of the work shift.

Employees signature _____ Date _____

Supervisors signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Cutting through VAT and asbestos cutback mastic on wood sub-flooring

This activity involves making a Class II building material friable *requires specific engineering controls, respirator protection and a regulated work area. Personnel air monitoring and daily exposure assessment is required.* Methods of compliance such as HEPA vacuums, wet methods and prompt clean up apply. Use of compressed air to remove ACM Materials is not allowed.

PRE-WORK SAFETY REQUIREMENTS:

1. Review at initial safety meeting: power tool cutting, abrading or sanding sheet flooring prohibited by Class II workers.
2. VAT and mastic contain asbestos and should be kept wet during cutting activities.
3. High speed cutting or abrasive disc saws must be equipped with point of cut vacuum hose attached to HEPA vacuum.
4. Dry sweeping, shoveling or other dry clean up of dust and debris is not allowed.

PERSONAL PROTECTIVE EQUIPMENT:

1. Full bodied polypropylene coveralls.
 2. Full face piece supplied air respirator operated in pressure demand mode, equipped with HEPA filter egress cartridges will be used until exposure assessment provides for downgrading to lesser protection.
 3. Powered air-purifying respirators can be worn if exposure assessment indicates airborne asbestos breathing zone sample results less than 10 f/cc (TWA).
 4. Full face piece air purifying respirators can be worn if exposure assessment indicates airborne asbestos breathing zone sample results less than 5 f/cc (TWA).
 5. 1/2 face air purifying respirators can be worn if exposure assessment indicates airborne asbestos breathing zone sample results less than 1 f/cc (TWA).
 6. Disposable cloth gloves.
3. Safety glasses.

PROPER REMOVAL STEPS:

1. Seal all critical barriers at work area perimeter.
2. Post full size DANGER ASBESTOS sign at work area entrance to restrict access of untrained personnel.
3. Lay drop sheet at entrance to work area for clean area.
4. Score, wet and remove single strip of vinyl floor tile (VAT) at cutting point.
5. Wet wood / asbestos mastic surface with amended water.
6. Cut through wood substrate with high speed cutting or abrasive disc saw equipped with point of cut vacuum hose attached to HEPA vacuum.
7. Immediately clean up all wood, mastic and tile dust with HEPA Vacuum.
Area must be cleaned of all debris prior to flooring removal by Class II workers.
8. All bagged, wrapped waste must be placed in locked disposal dumpster, holding area or enclosed transportation van no later than the end of the work shift.

Employees signature _____ Date _____

Supervisor's signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena, Montana

Metalbestos Siding and Roofing Removal Methods

PRE-WORK SAFETY REQUIREMENTS:

1. Review at initial safety meeting: Cutting, abrading or sanding metalbestos panels is prohibited.
2. Review at initial safety meeting: Intentionally breaking metalbestos panels is prohibited.

PERSONAL PROTECTIVE EQUIPMENT:

1. Disposable polypropylene coveralls.
2. 1/2 face air purifying respirator.
3. Safety glasses.
4. Disposable cloth gloves.

PROPER REMOVAL STEPS:

1. Lay 10 - 20 ft. drop sheet extending from base of panel surface to work area perimeter.
2. Install 2" "DANGER ASBESTOS" tape at work area perimeter to restrict access of non-certified trades.
3. Wet each panel or shingle before removal.
4. Cut nails with flat sharp hand tool.
5. Carefully remove wet shingle or panel to minimize breakage
6. Immediately lower panels or shingles to the ground.
7. Immediately bag or wrap CAB in labeled 6ml poly sheeting. All bagged or wrapped waste must placed in locked disposal dumpster or enclosed transportation van no later than the end of the work shift.

Employees signature _____ Date _____

Supervisors signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena, Montana

Vacuum Lead Dust Cleaning from inside of the Blast Furnace Flue

PRE-WORK SAFETY REQUIREMENTS:

1. Review at safety meeting: Workers will not eat, drink, smoke, or apply cosmetics inside the lead control work area. These activities are prohibited until the employee has left the lead control work area, passed through the hygiene facility and washed thoroughly.
2. Review at safety meeting: No employee will be allowed to enter the demarcated area without attending a Lead in Construction class that meets the requirements of 29 CFR 1926.62 and WAC 296-62-054 through 05427.

WORK AREA PREPARATION:

1. All work under these procedures will take place within a demarcated lead control area. The boundaries of the work area will be clearly visible. 3" Barrier tape and caution signs will meet specifications called for in 29 CFR 1926.62.
2. Prepare work area by installing 6 ml drop sheets at the entrance to the work area.
3. Seal doors, install barriers to create negative pressure enclosure and prohibit migration of lead dust beyond lead control area.
4. Install Hygiene station for hand washing prior to meals, breaks, and leaving the work area.

PERSONAL PROTECTIVE EQUIPMENT:

1. Until exposure assessment determines worker exposure levels to be below the action level of 30ug/m³ (averaged over an eight hour period) all personnel performing scraping or brushing operations will wear the following personal protective equipment:
 - 1/2 face air purifying respirator
 - Tyvek coveralls
 - Safety goggles or glasses
 - Disposable cloth work gloves
 - Ear protection
2. When results of exposure assessment are below 15 ug/m³, workers will wear the following personal protective equipment:
 - Re-usable cloth coveralls.
 - Re-usable cloth gloves.
 - 1/2 face air purifying respirator.
 - Safety glasses or goggles

REMOVAL PROCEDURES:

1. Personal protective equipment, work boots, and disposable cloth coveralls will be vacuumed and left within the work area before proceeding to the **hygiene facilities** (hand and face wash station). Until exposure assessment indicates airborne lead concentrations below 30ug/m³, a thorough hand and face wash will be performed immediately following removal of protective clothing and upon leaving the lead control area.
2. A remote three stage decon will be provided for change area, its use is required. Storage areas for your street clothes will be provided.
3. The industrial vacuum will be used to clean up the lead dust through out the flue, IRSE employees will also use small brushes to remove the material from the interior top portion of the flue that is not reachable with the vacuum attachments.
4. In the unlikely event that airborne lead levels reach 1/2 of the action level(15ug/m³), all work will stop until work practices can be modified, and or engineering controls can be installed to reduce airborne lead levels.

In the unlikely event that airborne levels of lead exceed 30ug/m³ all effected employees will be required to participate in blood sampling and analysis for lead and zinc protoporphirin levels. Each employee receiving blood monitoring shall be notified of the results within five working days after IRS receives the results. (See IRS Medical surveillance program for lead removal, employee orientation)

5. Eight hour representative personnel sampling will be conducted for the task or tasks within the work area that generate the most airborne lead concentrations. All monitoring and analysis will be performed according to NIOSH Method 7082 or equivalent. All employees will be notified of the results of this analysis within five days of the exposure assessment. Exposure assessments will continue as conditions change throughout cleaning project.

CLEAN UP AND DISPOSAL PROCEDURES:

1. Clean up all lead dust debris by the end of each workshift. At no time will visible dust debris be tracked or allowed to migrate from the lead control work area.
2. Place all lead dust waste in labeled and designated disposal drum prior to the end of each workshift.
3. All drums must be dated, sealed, labeled and stored in the designated hazardous waste storage area.

Supervisor/Trainer _____

Date _____

Employee _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Flange gasket and packing rope removal – furnace seals and joints and expansion joints,

This activity involves removal of a Class II building material. All methods of compliance such as HEPA vacuums, wet methods, prompt clean up apply. Use of compressed air to remove ACM Materials is not allowed.

PRE-WORK SAFETY REQUIREMENTS:

1. Review at initial safety meeting: IRSE power tool safety checklist. Review reciprocating saw safety features and requirements prior to operation.
2. Review at initial safety meeting: Operation of reciprocal saws requires safety glassed at all times during operation!!

PERSONAL PROTECTIVE EQUIPMENT:

The following personal protective equipment will be worn until a site specific negative exposure assessment is obtained.

1. Disposable polypropylene coveralls.
2. 1/2 face air purifying respirator with HEPA cartridges.
3. Safety glasses.
4. Disposable cloth gloves

PROPER REMOVAL STEPS:

1. Post 3" DANGER ASBESTOS barrier tape at work and DANGER ASBESTOS signs at all approaches and access points to the regulated work area to restrict access of untrained personnel
2. Set up a mini enclosure around the abatement area.
3. Wet any exposed lining or gasket material. Wrap tightly and securely with 6 ml poly and duct tape. Cut entire fitting or duct out by cutting pipe or on each side of fitting with reciprocating saw or band saw, leaving gasket in place and intact.
4. Immediately place all waste in two layer 6ml disposal bags and place in locked disposal dumpster, holding area or enclosed transportation van no later than the end of the work shift.

Employees signature _____ Date _____

Supervisors signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT.

Cutting through VAT and asbestos cutback mastic on wood sub-flooring

This activity involves making a Class II building material friable *requires specific engineering controls, respirator protection and a regulated work area. Personnel air monitoring and daily exposure assessment is required.* Methods of compliance such as HEPA vacuums, wet methods and prompt clean up apply. Use of compressed air to remove ACM Materials is not allowed.

PRE-WORK SAFETY REQUIREMENTS:

1. Review at initial safety meeting: power tool cutting, abrading or sanding sheet flooring prohibited by Class II workers.
2. VAT and mastic contain asbestos and should be kept wet during cutting activities.
3. High speed cutting or abrasive disc saws must be equipped with point of cut vacuum hose attached to HEPA vacuum.
4. Dry sweeping, shoveling of other dry clean up of dust and debris is not allowed.

PERSONAL PROTECTIVE EQUIPMENT:

1. Full bodied polypropylene coveralls.
2. Full face piece supplied air respirator operated in pressure demand mode, equipped with HEPA filter egress cartridges will be used until exposure assessment provides for downgrading to lesser protection.
3. Powered air-purifying respirators can be worn if exposure assessment indicates airborne asbestos breathing zone sample results less than 10 f/cc (TWA).
4. Full face piece air purifying respirators can be worn if exposure assessment indicates airborne asbestos breathing zone sample results less than 5 f/cc (TWA).
5. 1/2 face air purifying respirators can be worn if exposure assessment indicates airborne asbestos breathing zone sample results less than 1 f/cc (TWA).
6. Disposable cloth gloves.

PROPER REMOVAL STEPS:

1. Seal all critical barriers at work area perimeter.
2. Post full size DANGER ASBESTOS sign at work area entrance to restrict access of untrained personnel.
3. Lay drop sheet at entrance to work area for clean area.
4. Score, wet and remove single strip of vinyl floor tile (VAT) at cutting point.
5. Wet wood / asbestos mastic surface with amended water.
6. Cut through wood substrate with high speed cutting or abrasive disc saw equipped with point of cut vacuum hose attached to HEPA vacuum.
7. Immediately clean up all wood, mastic and tile dust with HEPA Vacuum.
Area must be cleaned of all debris prior to flooring removal by Class II workers.
8. All bagged, wrapped waste must placed in locked disposal dumpster, holding area or enclosed transportation van no later than the end of the work shift.

Employees signature _____ Date _____

Supervisor's signature _____ Date _____

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
East Helena MT

Window putty removal, intact removal methods

PRE-WORK SAFETY REQUIREMENTS:

1. *This work activity may require a site specific fall protection plan!* Make sure one is on site before beginning removal.
2. *Review site specific fall protection plan before any removal begins* at initial safety meeting. All workers new to the job site are required to review the fall protection plan and these work procedures before starting work.
3. *Review at initial safety meeting:* Cutting, abrading or sanding window putty is prohibited.
4. *Review at initial safety meeting:* Intentionally breaking Windows and Putty is prohibited.
5. This activity has a high possibility for cuts and lacerations. If necessary, tape windows to minimize shatter. Always wear safety glasses during window removal activities.
6. This activity requires a barricade to control access below window removal.
Eliminate risk of people walking below window removal operations!!

PERSONAL PROTECTIVE EQUIPMENT:

1. 1/2 face air purifying respirator.
2. Safety glasses.
3. Disposable cloth gloves.

PROPER REMOVAL STEPS:

1. Lay 10 - 20 ft. drop sheet extending from base of building to work area perimeter.
2. Tape glass to minimize shatter.
3. Wet each window before removal.
4. Remove and set aside trim board and shims.
5. Carefully remove wet window to minimize breakage
6. Immediately lower windows to the ground, scaffold or manlift surface, either manually or via dust tight chute.
7. Placed whole intact windows in a lined box, locked enclosed transportation container no later than the end of the work shift.

Employees signature _____ Date _____

Supervisors signature _____ Date _____

Appendix D

Fall Protection Plan

FALL PROTECTION WORK PLAN

A written fall protection work plan must be implemented by each employer on a job site where a fall hazard of 10 feet or greater exists, in accordance with Department of Labor and Industries, WISHA Regulations. The plan must be specific for each work site.

THIS WORK PLAN WILL BE AVAILABLE ON THE JOB SITE FOR INSPECTION.

Attached is a sample of a model fall protection work plan that may be filled out by each employer who has employees exposed above 10 feet. The following steps will help you fill out your plan.

1. FILL OUT THE SPECIFIC JOB INFORMATION.

Company Name:

IRS ENVIRONMENTAL OF WA

Job Name:

ASARCO Phase 4 Building Cleaning and Demolition

Date:

April 17, 2007

Job Address:

100 Smelter Road

City:

East Helena

Job Foreman:

Mark Kazemba

Jobsite Phone:

509-844-4267

2. FALL HAZARDS IN THE WORK AREA

INCLUDE LOCATIONS AND DIMENSIONS FOR HAZARDS

Elevator shaft: N/A

Stairwell: Stairs along the outside of the building coming from the floors above.

Leading edge: N/A

Window opening: When windows have been removed from the jam

Outside static line: N/A

Roof eave height: Various sizes

Perimeter edge: working from roof

Roof perimeter dimensions: N/A

Other fall hazards in the work area: Working from the man-basket of a all terrain articulating man lift and scissors lifts

3. METHOD OF FALL ARREST OR FALL RESTRAINT

(For fall protection equipment include details, such as manufacturer etc.)

Full body harness:

Used while working in the manlift

Body belt (Restraint only):

N/A

Lanyard:

Will be attached to anchor point with in the man lift basket

Dropline:

N/A

Lifeline:

Working from the roof

Restraint line: Working on flat roofs

Horizontal lifeline:

N/A

Rope grab:

Working from roof – safety lines

Deceleration device:

Used with conjunction with lanyard

Shock absorbing lanyard:

Will be attached to anchor point with in the man lift basket

Locking snap hooks:

Used on the ends of the lanyards

Safety nets:

N/A

Guard rails:

N/A

Anchorage points:

The approved by the manufacture of the manlift spot to attach a lanyard wit ha locking snap hook

Catch platform:

N/A

Scaffolding platform:

N/A

Safety monitor:

To be used on the roofs

Name of monitor, if used:

Other:

4. ASSEMBLY, MAINTENANCE, INSPECTION, DISASSEMBLY PROCEDURE

Assembly and disassembly of all equipment will be done according to manufacturers' recommended procedures.

(Include copies of manufacturer's data for each specific type of equipment used.)

Specific types of equipment on the job are:

Full body harnesses, lanyards and manlift

A visual inspection of all safety equipment will be done daily or before each use, as stated in the Employee Training Packet. Any defective equipment will be tagged and removed from use immediately. The manufacturer's recommendations for maintenance and inspection will be followed.

5. HANDLING, STORAGE & SECURING OF TOOLS AND MATERIAL

Toe boards will be installed on all scaffolding to prevent tools and equipment from falling from scaffolding.

Other specific handling, storage and securing is as follows:

Scaffolding will not be used as of this time on site, if scaffolding is used the fall protection work plan will be amended to reflect the use of scaffolding.

6. OVERHEAD PROTECTION

Hard hats are required on all job sites with the exception of those that have no exposure to overhead hazards. Warning signs will be posted to caution of existing hazards whenever they are present. In some cases, debris nets may be used if a condition warrants additional protection.

Additional overhead protection will include:

No additional protection will be required at this time,

7. INJURED WORKER REMOVAL

Normal first aid procedures should be performed as the situation arises. If the area is safe for entry, the first aid should be done by a foreman or other certified individual.

Initiate Emergency Services -- Dial 911 (where available)

Phone location: Job office and cell phone on Supervision's

First aid location: Company truck, decon trailer and company trailer, job box

Elevator location: N/A

Crane location: N/A

Other: _____ Location: _____

Rescue considerations. When personal fall arrest systems are used, the employer must assure that employees can be promptly rescued or can rescue themselves should a fall occur. The availability of rescue personnel, ladders, or other rescue equipment should be evaluated. In some situations, equipment that allows employees to rescue themselves after the fall has been arrested may be desirable, such as devices that have descent capability.

Describe methods to be used for the removal of the injured worker(s):

Injured worker will not be moved if the injured worker is safe from harms way. If the worker needs to be moved all precautions will be taken to not injury the worker anymore than what they are already.

8. TRAINING AND INSTRUCTION PROGRAM

All new employees will be given instructions on the proper use of fall protection devices before they begin work. They will sign a form stating they have been given this information. This form becomes part of the employee's personnel file.

The written fall protection work plan will be reviewed before work begins on the job site. Those employees attending will sign below. The fall protection equipment use will be reviewed regularly at the weekly safety meetings.

Date: _____

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Foreman or Job Superintendent: _____

Prior to permitting employees into areas where fall hazards exist, all employees must be trained regarding fall protection work plan requirements. Inspection of fall protection devices/systems must be made to ensure compliance with WAC 296-155-24

Appendix E

Notifications

APPLICATION FOR A MONTANA ASBESTOS PROJECT PERMIT AND NESHAP DEMOLITION/RENOVATION NOTIFICATION

TYPE OF APPLICATION/PERMIT (See Instructions)				ACCOUNTING CODE: 5748332 / 592702 / 02202			
<input type="checkbox"/> Project Permit	<input type="checkbox"/> Project Permit Revision	<input type="checkbox"/> Courtesy Notification (NESHAP)	<input type="checkbox"/> Annual Permit	<input type="checkbox"/> NESHAP Notification	<input type="checkbox"/> NESHAP Notification Revision	<input type="checkbox"/> Annual Permit Amendment	<input type="checkbox"/> Annual Permit w/Contractor
TYPE OF NOTIFICATION							
<input type="checkbox"/> Renovation (R)	<input type="checkbox"/> NESHAP Demo/Reno	<input type="checkbox"/> Ordered Demolition (O)	<input type="checkbox"/> Transport (T)	<input type="checkbox"/> Demolition (M)	<input type="checkbox"/> Courtesy (C)	<input type="checkbox"/> Emergency Renovation (E)	<input type="checkbox"/> Disposal (D)
<input type="checkbox"/> Annual	(For Annual Permit Holders) Annual Permit		MTF				
ASBESTOS PROJECT CONTRACTOR (Operator)							
Asbestos: Project Contractor, Individual or Company Name							
Mailing Address				City	County	State	Zip
Telephone Number		Fax Number		Contractor Contact Person (First and Last Name)			
On-Site Project Contractor/Supervisor				Contractor/Supervisor Accreditation Number		Expiration Date	
DEMOLITION/RENOVATION CONTRACTOR (Operator)							
Demolition/Renovation Contractor, Individual or Company Name							
Mailing Address				City	State	Zip	County
Telephone Number		Fax Number		Contractor Contact Person (First and Last Name)			
SITE INFORMATION							
Building Name / Site							
Location Address				City	State	Zip	County
Site Telephone Number				Location Contact Person (First and Last Name)			
Building Size (sq. ft.)	Number of Floors	Age of Site In Years	Latitude	Longitude	Township	Range	Section
SITE/BUILDING OWNER							
Owner Name							
Mailing Address				City	State	Zip	County
Telephone Number				Contractor Contact Person for Owner (First and Last Name)			
LOCATION PRESENT USE*							
* Commercial - Hospital - Industrial - Miscellaneous - Office - Public Building Residence - School - Ship/Boat - University/College - Vacant							
<input type="checkbox"/> C	<input type="checkbox"/> H	<input type="checkbox"/> I	<input type="checkbox"/> M	<input type="checkbox"/> O	<input type="checkbox"/> P	<input type="checkbox"/> R	<input type="checkbox"/> S
<input type="checkbox"/> B	<input type="checkbox"/> U	<input type="checkbox"/> V					
LOCATION PRIOR USE*							
<input type="checkbox"/> C	<input type="checkbox"/> H	<input type="checkbox"/> I	<input type="checkbox"/> M	<input type="checkbox"/> O	<input type="checkbox"/> P	<input type="checkbox"/> R	<input type="checkbox"/> S
<input type="checkbox"/> B	<input type="checkbox"/> U	<input type="checkbox"/> V					
PRE-RENOVATION/DEMOLITION ASBESTOS INSPECTION INFORMATION							
Is Asbestos Present? <input type="checkbox"/> Yes <input type="checkbox"/> No				Date of Inspection:			
Printed Name of Inspector Who Performed Inspection				Accreditation Number		Expiration Date	
TYPE OF AND APPROXIMATE AMOUNT OF ASBESTOS MATERIAL							
RACM to be Abated (See Instructions)		Non-Friable ACM to be removed		Non-Friable ACM not to be abated		Amount and unit of measurement	
	RACM	CAT I	CAT II	CAT I	CAT II	Amount	Measurement
Material No. 1						<input type="checkbox"/> SF <input type="checkbox"/> LF <input type="checkbox"/> CF	
Material No. 2						<input type="checkbox"/> SF <input type="checkbox"/> LF <input type="checkbox"/> CF	
Material No. 3						<input type="checkbox"/> SF <input type="checkbox"/> LF <input type="checkbox"/> CF	
Material No. 4						<input type="checkbox"/> SF <input type="checkbox"/> LF <input type="checkbox"/> CF	
Material No. 5						<input type="checkbox"/> SF <input type="checkbox"/> LF <input type="checkbox"/> CF	
Material No. 6						<input type="checkbox"/> SF <input type="checkbox"/> LF <input type="checkbox"/> CF	
SCHEDULED DATES FOR ASBESTOS ABATEMENT				SCHEDULED DATES FOR DEMOLITION/RENOVATION			
Start Date (mm/dd/yy)		Complete Date (mm/dd/yy)		Start Date (mm/dd/yy)		Complete Date (mm/dd/yy)	

PROJECT DESIGN INFORMATION					
Print Name of Project Designer (PD)			(Accreditation Number/Exp. Date)		
RACM WASTE TRANSPORTER			<input type="checkbox"/> Check if same as Abatement Contractor		
Contractor, Individual or Company Name					
Mailing Address		City	State	Zip	
Telephone Number		Fax Number	Contractor Contact Person (First and Last Name)		
RACM WASTE DISPOSAL SITE					
<div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Allied Waste Systems of Montana Missoula Landfill <input type="checkbox"/> Butte Silver Bow Government Landfill <input type="checkbox"/> City of Billings Solid Waste Division Landfill <input type="checkbox"/> City of Hardin Class II Landfill <input type="checkbox"/> City of Malta Landfill <input type="checkbox"/> City of Shelby Landfill <input type="checkbox"/> Coral Creek Landfill <input type="checkbox"/> Daniels County Commissions Scobey Landfill <input type="checkbox"/> Flathead County Solid Waste District Kalispell Landfill <input type="checkbox"/> High Plains Sanitary Landfill Site 1 - Great Falls/Flowerree </div> <div style="width: 50%;"> <input type="checkbox"/> Libby Class II Landfill <input type="checkbox"/> Miles City Area Solid Waste Dist Landfill <input type="checkbox"/> Northern MT Joint Refuse Disposal Dist Conrad Landfill <input type="checkbox"/> Park County Refuse Disposal Dist Livingston Landfill <input type="checkbox"/> Richland County Solid Waste Dist Sidney Landfill <input type="checkbox"/> Sheridan County Solid Waste Dist Plentywood Landfill <input type="checkbox"/> Valley County Refuse Dist 1 Glasgow Landfill <input type="checkbox"/> Valleyview Class II CCSS Waste Landfill <input type="checkbox"/> Other: _____ </div> </div>					
THIS SECTION APPLIES TO FACILITY DEMOLITIONS/RENOVATIONS					
<p><i>I certify that the above information is correct and that a State-accredited asbestos inspector inspected the facility for asbestos prior to demolition/renovation. This Notice must be submitted to the Department at least 10 days prior to the start of work.</i></p>					
Printed Name / Signature			Date		
THIS SECTION APPLIES TO ASBESTOS PROJECTS					
<p><i>I certify that all work performed pursuant to the authorization of the Asbestos Abatement Project Permit will be performed in accordance with 29 CFR 1926.1101, 40 CFR 763 subpart E, 40 CFR 763.120, 40 CFR 763.121, 40 CFR 763.124, 40 CFR part 61 subpart M, §§ 75-2-501 through -519, MCA, and ARM 17.74.301 through 406. In addition, I hereby certify that asbestos-containing waste materials removed during this project will be transported properly and disposed of in a State-approved Class II landfill or similar approved asbestos disposal facility.</i></p>					
Printed Name / Signature			Date		
FOR ASBESTOS PROJECTS PLEASE PROVIDE PER ARM 17.74.355					
<input type="checkbox"/> A. Project design. <input type="checkbox"/> B. List of accredited asbestos personnel with their accreditation ID numbers and expiration dates. <input type="checkbox"/> C. Copy of the contract showing the contract dollar amount for asbestos abatement. <input type="checkbox"/> D. Appropriate fee (see Fee Schedule below).					
<u>CONTRACT VOLUME</u>	<u>FEE</u>	<u>CONTRACT VOLUME</u>	<u>FEE</u>	<u>CONTRACT VOLUME</u>	<u>FEE</u>
\$0-\$500	---	\$7,501-\$10,000	\$417	\$75,001-\$100,000	\$3,627
\$501-\$3,000	\$ 91	\$10,001-\$20,000	\$686	\$100,001-\$250,000	\$6,552
\$3,001-\$5,000	\$201	\$20,001-\$50,000	\$1,531	\$250,001-\$375,000	\$13,416
\$5,001-\$7,500	\$364	\$50,001-\$75,000	\$2,652	Greater than \$375,000	\$20,000
Actual Contract Volume		Fee Amount Enclosed		Check No.	
				DEPOSIT LOG NO.	
<p>Mail completed form and fee to: MT DEQ Asbestos Control Program, 1520 East 6th Avenue, PO Box 200901, Helena, MT 59620-0901</p> <p>Mont. Code Ann. § 75-2-503(2) requires the department to issue a permit decision within seven calendar days following receipt of a complete application for asbestos abatement projects which cost \$3000 or less. For projects exceeding \$3000, the estimated time to process and issue a decision is ten working days.</p>					
FOR EMERGENCY RENOVATIONS - APPLICATION MUST BE SUBMITTED WITHIN FIVE DAYS OF NOTIFICATION					
Date of Emergency					
(Start Date)		(Complete Date)			
Description of the sudden, unexpected event.					
IF DEMOLITION IS ORDERED BY A GOVERNMENT AGENCY, SUBMIT COPY OF GOVERNMENT ORDER					

Appendix F
Material and Equipment Data

Hako

Minuteman

Series 800 Asbestos Vacuum Systems For Safe Control & Removal of Asbestos and Other Toxic Materials

- Wet or Dry Pick-Up
- Portable or Large Capacity
- Electric or Air-Operated
- Painted or Stainless Steel



Back Pack Asbestos Vac



6 Gallon Asbestos Vac



20 or 55



Twin-Powered Asbestos Vac



Air-Powered Asbestos Vac



All units equipped with H.E.P.A. filters with minimum 99.99% efficiency at 0.12 microns.

Critical Systems

Houston, Texas

4015503/2 (CRITICAL) 800-777-6767



MACH 2

NEGATIVE PRESSURE SYSTEM

FEATURES:

- *HEPA Fall Safe Switch
- *Four Easy Lift Handles
- *Cumulative Hour Meter
- *Static Pressure Gauge
- *Speed Selector Switch
- *12" Dia. Discharge
- *4" Heavy Duty Swivel Casters
- *18 Gauge Stainless Steel or
- *.000 inch Aluminum Construction
- *Intake Adaptor Available

OPTIONAL ALARM SYSTEM

- *Normal (Run) - Light
- *High Pressure (Filter Loading) - Audible & Visual Warning
- *Low Pressure (Blocked Discharge, Filter Rupture & Shutdown) - Audible & Visual Warning

SPECIFICATIONS:

- *Two Speeds : 2100 CFM 1411 CFM
- *Dimensions : 38" L x 37.5" H x 29" W
- *Weight : 180 lbs. with filters - Aluminum
225 lbs. with filters - Stainless
- *Motor : 1 3/4Hp - Thermally Protected
- *Power : 110 / 115 Volts / 60 Hz
- *Full Load Amps : 15.8 Amps
- *Circuit Protection: 20 Amps
- *Filters : 24" x 24" x 1" Primary
24" x 24" x 2" Secondary
24" x 24" x 1 1/2" HEPA



In a sticky situation? Then turn to...

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We've got what
you need for
adhesives



\$88.00/case

3M

3M2090 Blue
Painters Tape
&
3M2020 Masking

1" 1.5" 2" 3"
Call for Pricing



TYC827 - White
Poly Tape **\$110.50**
2" 24/case



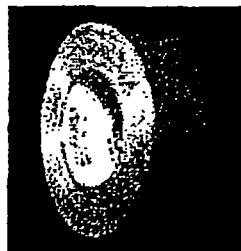
ABATIX® Brand
Duct Tape - Case
Quantities Only
2" 24/case or
3" 16/case



Nashua 398 2" 24/cs **\$94.50**
& 3" 16/case **\$94.50** Silver

Premium 357 2" Silver **\$168.75**
Case Quantities Only

Abatix Corp
1808 B St NW
Auburn WA
98001



TYC809
Yellow Vinyl
2" 24/case
\$70.00

Toll Free 1-800-500-8355

Prices good only through month of May

HEAVY DUTY ADHESIVE SPRAY

• Wide Web Spray
• Temporary or Permanent Bonds
• No Chlorinated Solvents
• Cleans Easily



HEAVY DUTY ADHESIVE SPRAY

This wide web spray adhesive is one of the highest performance aerosol adhesives available. For both temporary or permanent bonding, this high solids product is ideal for uneven or porous surfaces and weight materials. Waterproof flexible transparent and non-staining, use this product for your toughest adhesive applications with materials such as leather, cardboard, most plastics, polyethylene sheeting and cloth. Formulated with the environment in mind, this product contains NO CHLORINATED SOLVENTS OR OZONE DEPLETERS. Cleans easily with Mineral Spirits. Not intended for use on vinyl.

DIRECTIONS

Always shake well before using. Never aim valve at face. Hold can upright and apply adhesive in a side to side motion 10 to 14 inches from surface.

TEMPORARY BONDS: Spray surface, allow to tack and apply material to be bonded.

PERMANENT BONDS: Liberally spray both surface and material, allow to tack, then apply.

CLEANING SPRAY TIP: When finished with a particular spray application, always turn can upside down and spray for two seconds to clear valve and prevent clogging. If adhesive accumulates around nozzle wipe clear while wet. If dried in valve opening, remove with degreasing solvent.

DANGER: Extremely Flammable. Contains Hexane and Acetone. Use with adequate ventilation. Keep away from heat, sparks, open flame or other ignition sources. Avoid inhalation of spray mist or vapors. If overcome, move patient to fresh air. Call a physician immediately. Avoid contact with eyes and skin. In case of eye contact, flush immediately with water and continue for 15 minutes. If irritation persists, see a physician. For skin contact, wash with soap and water. If irritation persists, call a physician immediately. Harmful or fatal if swallowed. Do not take internally. If swallowed, do not induce vomiting. Contact a physician immediately. Contents under pressure. Do not puncture or incinerate container. Do not store at temperatures above 120°F. KEEP OUT OF REACH OF CHILDREN.

08/98

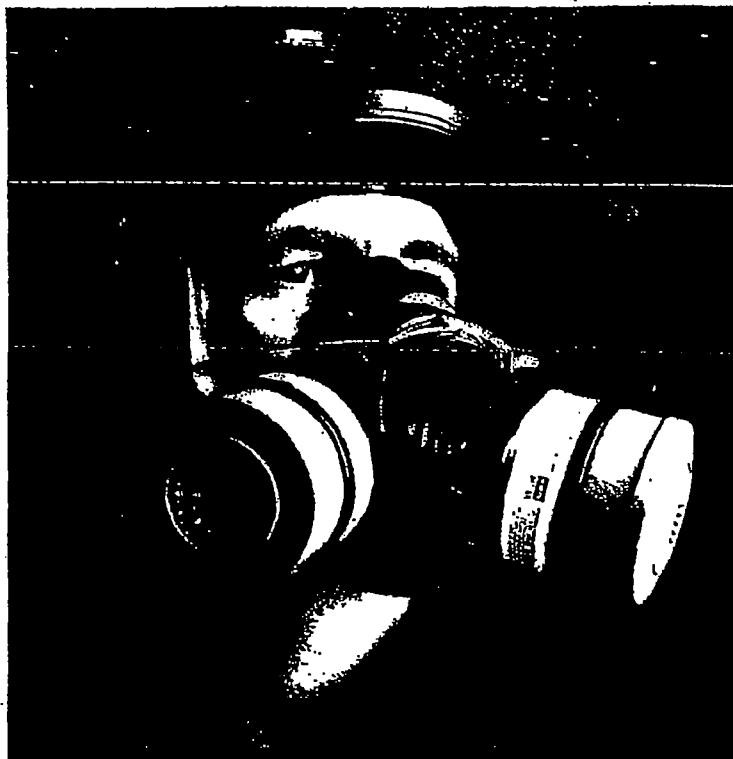
Manufactured for
ABATIX ENVIRONMENTAL CORP

Dallas, TX 75227	214-381-1146	
Houston, TX	713-956-2062	Hayward, CA 510-471-5997
Santa Fe Springs, CA	310-944-3445	Denver, CO 303-373-1000
Phoenix, AZ	602-437-4993	Kent, WA 206-872-6055

NORTH 7600 SERIES FULL FACEPIECE AIR PURIFYING RESPIRATORS

NIOSH/MSHA Certified

The North 7600 Series full facepiece respirators are designed to provide eye, face and respiratory protection while providing optimum comfort. While affording an over 200° field of vision, the hard coated polycarbonate lens protects the wearer's eyes and face against irritating gases, vapors and flying particles. The polycarbonate lens also features optical properties similar to the North 180® Protective Spectacle to minimize distortion and astigmatism.



7600 Series
(shown with
N7500-8 Filters)

Features	Benefits
Dual flange	Superior fit characteristics. Less inventory and purchasing problems.
Silicone full facepiece	Soft, pliable superior comfort and fit.
Two facepiece sizes, small and medium/large	Comfortable fit for the largest number of respirator wearers.
Chin cup	Positions facepiece properly.
Designed to cover worker's entire face	Worker is provided with eye and face protection from gases, vapors and particles.
Direct cartridge-to-facepiece connection	Secure fit. Creates a cartridge-to-facepiece seal without the use of gaskets.
Cartridges have an inside thread connection	Threads are protected - less likelihood of thread damage.
5 strap head harness and comfortable	Facepiece-to-face seal is effectively maintained.
Oral/nasal cup	Reduces fogging. Lessens "dead-air" space. Standard equipment.
Speaking diaphragm	Easy communication. Standard equipment.
Cast aluminum lens clamps	Secure lens-to-facepiece seal.
Neck strap	Allows wearer to park the respirator when not in use.
Hard coated polycarbonate lens	Excellent optics. Scratch and impact resistant. Meets impact and penetration requirements of ANSI Z87.1-1989.
Wraparound lens	Provides over 200° field of vision. Anti-claustrophobic design.
Lightweight	Adds to comfort, worker acceptance and reduced fatigue. Higher worker productivity.
Certified NIOSH/MSHA	Compliance with OSHA requirement.

North Safety Equipment

NORTH 7700 SERIES HALF MASK AIR- PURIFYING RESPIRATORS

NIOSH/MSHA Certified

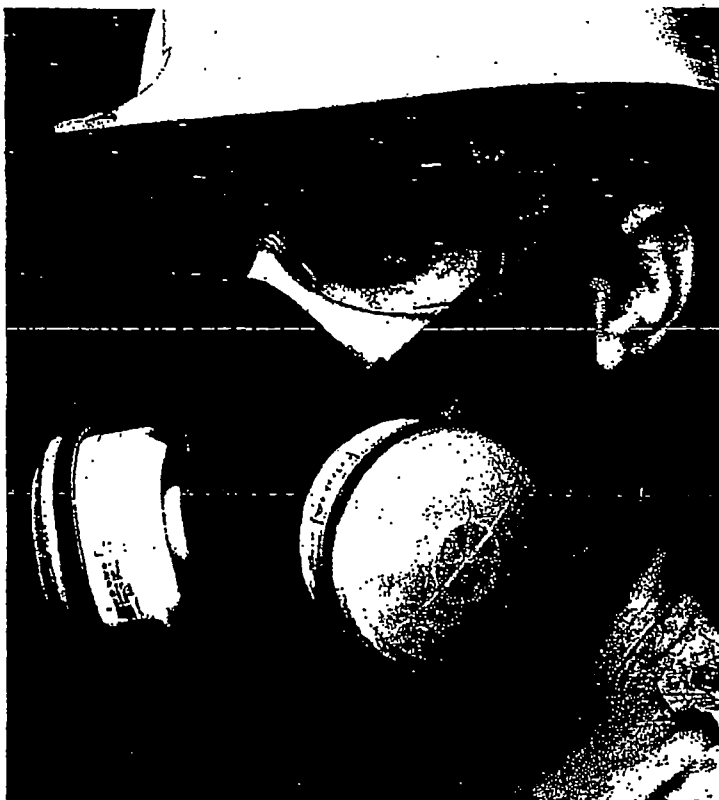
The North 7700 Series is the most comfortable half mask respirator available today. What makes it so comfortable? For one thing, the facepiece is made of soft, hypoallergenic silicone rubber. Because silicone rubber's so much more flexible than organic rubber, it conforms to a worker's face. And three facepiece sizes make it much easier to fit your workers.

The North 7700's cradle suspension system also adds to the comfort of this respirator. The North 7700 doesn't slip like respirators with conventional strap systems. The cradle suspension gives an even seal without creating pressure points.

The low profile of the North 7700 gives workers a wide field of vision and room for protective eyewear. Its low inhalation and exhalation resistance makes breathing easier, leaving more energy for production.







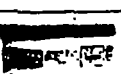
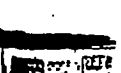




Series 7700
(Shown with N7500-3 Cartridges)



Features	Benefits
State-of-the-art design and materials	Provides wearers with the best fitting, most comfortable facepiece, thereby improving health and safety.
Silicone facepiece material	Wearer comfort. Readily conforms to facial features and doesn't harden with age. Easy to clean. Durable. Stands up to repeated cleanings better than any other facepiece material. Resists distortion, ensuring a better fit, time after time.
Contoured sealing flange	The most comfortable, best fitting half mask facepiece available. Eliminates discomfort caused by pressure points on facial nerves. Design of nose area provides excellent fit and comfort.
Extended side flanges	Provide best possible seal during talking or other facial motions.
Low dead-air space	Improves worker comfort by limiting "re-breathing" of exhaled air.
Three overlapping facepiece sizes	Comfortable fit for largest number of respirator wearers.
Cradle suspension system	Cradle straps provide a comfortable, secure fit without slipping. Convenient side adjustment of headband straps. "One-Piece" suspension prevents loss or mis-assembly of individual straps. Easily removed for cleaning.
Headband yoke	Allows cartridges to be located lower and further back, improving side vision.
Exhalation valve assembly	Exceptionally low breathing resistance. Positive pressure fit check without removing cover.
Direct cartridge-to-facepiece seal	Eliminates the risk of improper seal and reduced protection due to lost or worn sealing gaskets. Minimizes replacement parts inventory. Ease of maintenance, no cartridge receptacles to clean.

NORTH DUAL CARTRIDGE AND FILTER AIR-PURIFYING RESPIRATORS

	N7000-1 Organic Vapor Cartridge	Organic Vapors Approved for respiratory protection against organic vapors	7701L TC-23C-49 7701M TC-23C-49 7701S TC-23C-49	77BP01L TC-23C-102 77BP01M TC-23C-102 77BP01S TC-23C-102	7601 TC-23C-180
	N7000-1 Organic Vapor Cartridge N7000-6 Dual/Filter Prefilter N7000-27 PB Check/Filter Cover	Organic Vapors, and Dust and Mists Approved for respiratory protection against organic vapors, dusts and mists having a time-weighted average not less than 0.05 milligram per cubic meter or 2 million particles per cubic foot.	7711L TC-23C-73 7711M TC-23C-73 7711S TC-23C-73	77BP11L TC-23C-103 77BP11M TC-23C-103 77BP11S TC-23C-103	7611 TC-23C-185
	N7000-1 Organic Vapor Cartridge N7000-6 Dual/Filter Prefilter N7000-27 PB Check/Filter Cover	Fuels, Lacquers, Enamel Mists and Organic Vapors Approved for respiratory protection against (1) mists of paints, lacquers and enamels; (2) organic vapors or (3) any combination thereof. Do not use for protection against paints containing isocyanate.	7731L TC-23C-75 7731M TC-23C-75 7731S TC-23C-75	77BP31L TC-23C-178 77BP31M TC-23C-178 77BP31S TC-23C-178	7631 TC-23C-188
	N7000-1 Organic Vapor Cartridge N7000-6 Dual/Filter Prefilter N7000-27 PB Check/Filter Cover	Pesticides Approved for respiratory protection against pesticides. Not approved for fumigants.	7749L TC-23C-74 7749M TC-23C-74 7749S TC-23C-74	77BP49L TC-23C-178 77BP49M TC-23C-178 77BP49S TC-23C-178	7649 TC-23C-190
	N7000-2 Acid Gases Cartridge	Chlorine, Hydrogen Chloride, Sulfur Dioxide and Selenic Acid Approved for respiratory protection against chlorine, hydrogen chloride, sulfur dioxide or selenic acid.	7702L TC-23C-226 7702M TC-23C-226 7702S TC-23C-226	77BP02L TC-23C-227 77BP02M TC-23C-227 77BP02S TC-23C-227	7602 TC-23C-228
	N7000-2 Acid Gases Cartridge N7000-4 Dual/Filter Prefilter N7000-27 PB Check/Filter Cover	Chlorine, Hydrogen Chloride, Sulfur Dioxide and Selenic Acid Approved for respiratory protection against chlorine, hydrogen chloride, sulfur dioxide or selenic acid; dusts and mists having a time-weighted average not less than 0.05 milligram per cubic meter or 5 million particles per cubic foot.	7712L TC-23C-229 7712M TC-23C-229 7712S TC-23C-229	77BP12L TC-23C-230 77BP12M TC-23C-230 77BP12S TC-23C-230	7612 TC-23C-231
	N7000-3 Organic Vapors and Acid Gases Cartridge	Organic Vapors, Chlorine, Hydrogen Chloride, and Sulfur Dioxide Approved for respiratory protection against organic vapors, chlorine, hydrogen chloride, or sulfur dioxide.	7703L TC-23C-85 7703M TC-23C-85 7703S TC-23C-85	77BP03L TC-23C-104 77BP03M TC-23C-104 77BP03S TC-23C-104	7603 TC-23C-181
	N7000-3 Organic Vapors and Acid Gases Cartridge N7000-4 Dual/Filter Prefilter N7000-27 PB Check/Filter Cover	Organic Vapors, Chlorine, Hydrogen Chloride, and Sulfur Dioxide and Dusts and Mists Approved for respiratory protection against organic vapors, chlorine, hydrogen chloride, or sulfur dioxide; dusts and mists having a time-weighted average not less than 0.05 milligram per cubic meter or 2 million particles per cubic foot.	7713L TC-23C-66 7713M TC-23C-66 7713S TC-23C-66	77BP13L TC-23C-105 77BP13M TC-23C-105 77BP13S TC-23C-105	7613 TC-23C-186
	N7000-4 Ammonia and Methyl Amine Cartridge	Ammonia and Methyl Amine Approved for respiratory protection against ammonia or methyl amine.	7704L TC-23C-63 7704M TC-23C-63 7704S TC-23C-63	77BP04L TC-23C-176 77BP04M TC-23C-176 77BP04S TC-23C-176	7604 TC-23C-182
	N7000-4 Ammonia and Methyl Amine Cartridge N7000-6 Dual/Filter Prefilter N7000-27 PB Check/Filter Cover	Ammonia and Methyl Amine Approved for respiratory protection against ammonia or methyl amine; dusts and mists having a time-weighted average not less than 0.05 milligram per cubic meter or 2 million particles per cubic foot.	7714L TC-23C-64 7714M TC-23C-64 7714S TC-23C-64	77BP14L TC-23C-177 77BP14M TC-23C-177 77BP14S TC-23C-177	7614 TC-23C-187

KLEENGUARD COVERALLS



BASIC PROTECTION

KleenGuard BP Coveralls offer workers protection against asbestos fibers and other particles at an economical price. This fabric allows air to pass through to evaporate perspiration and cool the skin -- making workers more comfortable and reducing heat stress. Designed for short duration use including asbestos abatement.

Stock No. 010523 X-Large With Hood and Boot

Stock No. 010524 XX-Large With Hood and Boot

GENERAL PROTECTION

KleenGuard GP Coveralls offer effective protection against many particles including asbestos fibers -- including water and water based products. KleenGuard breathes like cloth, keeping workers cooler and more comfortable. Ideal for asbestos removal jobs where significant water is used and worker might get wet.

Stock No. 010503 XX-Large White with elastic back and wrist

Stock No. 010520 Large, White with elastic back and wrist,
attached hood and boots.

Stock No. 010521 X-Large, White with elastic back and wrist,
attached hood and boots

Stock No. 010533 XX-Large, White with elastic back and wrist,
attached hood and boots.

Stock No. 010525 X-Large, Grey with Hip-pocket

Stock No. 010526 XX-Large, Grey with Hip-pocket

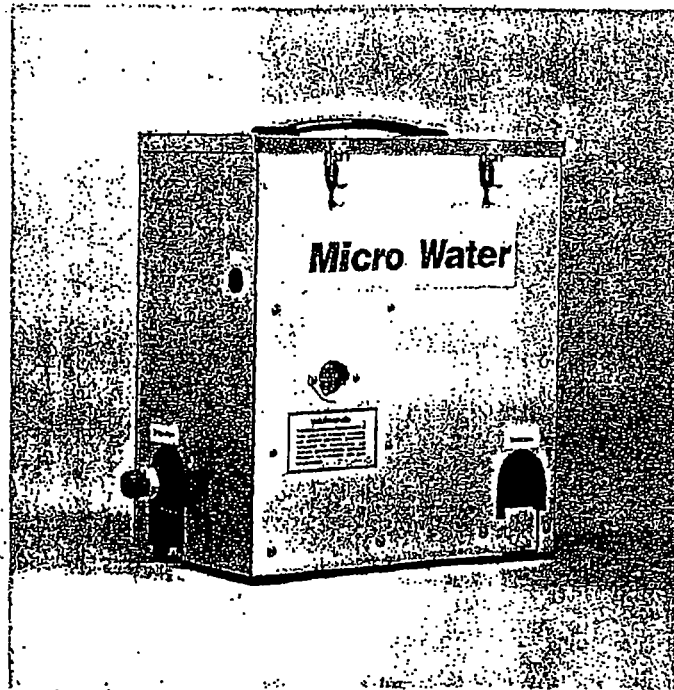
Stock No. 010518 Hood only with Elastic face

Stock No. 010519 Elastic Top Boot Cover

Critical Systems

Houston, Texas

ADAPTION OF CRITICAL SYSTEMS



MICRO WATER

SHOWER WATER FILTRATION SYSTEM

FEATURES :

- * Compact Version of the Mini Water System
- * High Quality Shower Water Filtration
- * Impervious to Rust and Corrosion
- * Enclosed in a Stainless Steel Cabinet
- * Lightweight & Mobile
- * Self Priming to 10 Feet of Suction Lift
- * Built-In Electric Level Control Actuator
- * Actuator Engages at 2.5" and Disengages at 1" of Water Level (Adjustable)
- * Pressure Gauges on Each Stage
- * Two Stage Filtration :
 - 1st stage : 20 Micron
 - 2nd stage : 5 Micron

SPECIFICATIONS :

- * Dimensions : 10 1/2" D x 10 1/2" W x 18" H
- * Weight : 32 lbs. Dry
- * Water Connections : Garden Hose Thread
- * Motor : 1/12 Hp - Thermally Protected
- * Power : 115 Volts / 60 Hz
- * Full Load Amps : 1.75 Amps
- * Flow Capacity : 5.5 gpm @ 5 psi
4.7 gpm @ 8 psi

Critical Systems

TM

A Division of Critical Industries, Inc.

MICRO WATER FILTRATION SYSTEM

Specifications:

Dimensions:
Base and Case:
Weight:
Power supply:
Gauges:

Level control:

Flow Capacity:

Inlet connection:
Outlet connection:

16 1/2 in. L x 11 in. W x 18 1/2 in. H
304 Stainless Steel
30 pounds
115 VAC/60 Hz.
Pressure gauges located on both stages
to indicate filter loading.
Built in electrical level control
actuator.
"On" at 2.5 in. WC "Off" at 1 in. WC
5.5 GPM @ 7 Ft. of Head
4.7 GPM @ 18.5 Ft. of Head
Female or male garden hose thread.
Male garden hose thread.

PUMP

Pump Body Material:
Impeller:
Liq. Temperature Range:
Priming:

Bronze, chrome plated
Neoprene
140 degrees F to 40 degrees F
Self priming to 10 feet of suction
lift.

MOTOR

Amps:
Protection:
Horsepower:

1.75 amps.
Thermally protected (Automatic)
1/12 Hp.

FILTRATION

Stage I:

9.75 in. disposable 20 micron pleated
polyester cartridge 5 sq. ft.

Stage II:

9.75 in. disposable 5 micron pleated
polyester cartridge 5 sq. ft.

Features:

corrosion resistant filter housing.

Critical Systems

A Division of Critical Industries, Inc.

TM

MINI WATER FILTRATION SYSTEM

SPECIFICATION:

Dimensions:

Weight:

Power Supply:

Gauges:

Level Control:

(standard)

Flow Capacity:

Inlet Connections:

Outlet Connections:

30" L x 30" W x 38" H

55 lbs. Dry

110 VAC/60 Hz

Pressure gauges located on each stage indicate filter loading

Electric

"ON" @ 6.75" "OFF" @ 1.5" of water

17 gpm @ 8.5 psi

FGHT

MGHT

PUMP

Model No:

Housing Material:

Impeller

IP 862A

Aluminum

Aluminum

MOTOR

Model No:

H.P.:

RPM:

Full Load Amps:

Frame:

Service:

Thermal Protection:

5K956B

1/3

3450

6

56T

1.85

Yes (Automatic Reset)

FILTRATION

Stage I:

Three 19.5" disposable 20 micron pleated polyester cartridges-25 sq.ft. (total)

Stage II:

Two 9.75" disposable 5 micron pleated polyester cartridges-10 sq.ft. (total)

OMNIGUARD™ III

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features | [details](#) | [specifications](#) | [accessories & options](#) | [distributors](#) | [tech support](#) | [software downloads](#)

The clear choice for monitoring and documenting Vacuum and Pressure in a containment area. Ideal for Asbestos, Lead and Mold abatement and Clean Room monitoring. The Omniguard III utilizes state of the art pressure measurement technology to accurately monitor negative pressure inside a containment area. With features designed to display information clearly and quickly, you'll be confident that you have the best instrument for the job.



- Large graphic display shows current pressure, monitoring status and alarm settings at a glance
- Instant on screen help
- Programmable high and low alarm setpoints
- Menu driven interface for easy setup and use
- Easy calibration in the field, temperature compensated for unsurpassed accuracy.
- Dual Inlet ports allow monitoring between two areas
- Memory capacity for over 2000 readings, each pressure reading and alarm occurrence logged with individual time and date stamp
- Multiple reports available at the touch of a key
- 95 decibel audible alarm notifies workers and bystanders when containment is lost
- Relay output supports remote alarm, telephone autodialer or external fan units
- Thermal printer, no ink ribbons
- Paper stores easily in protected compartment
- Rugged self-contained unit includes power cord, owner's manual, 10' of hose and spare paper roll stored in the lid
- Serial port is easily accessible for sending logs to a PC
- Year 2000 compliant

Configurable Features

- High and low alarm setpoints
- Date and time
- Print/log interval adjustable to

- conserve paper and memory
- Relay output can trigger remote alarm, autodialer or other external device
- Variable response rate to avoid nuisance alarms in windy environments
- Passcode protection prevents unauthorized tampering with job settings
- Pressure displayed in units of Inches WC, Millimeters WC or Pascals
- Automatic printout and logging of all changes to settings
- Configuration report prints current settings and monitoring status for easy review
- View log on screen, scroll through entire memory contents



Designed to be the most reliable long term monitoring recorder in field, the Omniguard III offers compact design, ease of use and durability that will last from job to job.

Top of page

Engineering Solutions Inc. • Tukwila, WA • (206) 241-9395 • Fax (206) 241-9411

6 GALLON H.E.P.A. FILTERED VACUUMS

These high performance 6 gal. vacuums are a must for small jobs, glove bagging, tight areas, and laboratories. With all the features of a larger vacuum, (Dry and Wet/Dry capabilities) yet light weight and portable for easy transportation.

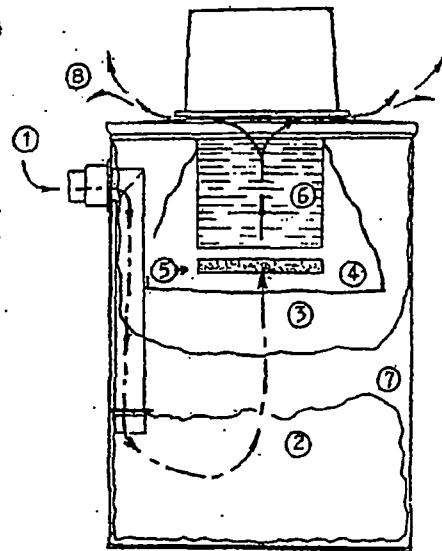
These vacuums feature a H.E.P.A. (High Efficiency Particulate Air) filter that is 99.99% efficient at 0.3 micron (D.O.P. method) - meets or exceeds OSHA and EPA re-

quirements for cleaning the air of lead, asbestos, and other toxic dust. NIKRO H.E.P.A. filtered vacuums have a five stage filtration system; Disposable paper bag, Secondary paper filter, Water Repelling/Non-Clinging Dacron filter bag, Micro-Impact filter, and the H.E.P.A. filter which is positioned in front of the motor, protecting component parts from contamination.

Whatever the application.....Turn to NIKRO for a Safer Environment.

OPERATION

- 1) Debris enters the vacuum through the intake and travels down the tube.
- 2) The collection bag is the first of five filters. Here the bulk of the debris is collected, allowing safe, easy disposal.
- 3) The secondary paper filter traps the larger size dust particles which escape from the collection bag, protecting the life of the dacron filter bag.
- 4) The water repelling/non-clinging dacron filter bag sheds water and soot, protecting the H.E.P.A. filter from moisture, larger dust particles, etc.
- 5) The micro-impact filter is composed of specially treated, high efficiency, high density, woven fiberglass and is the most important of the four pre-filters.
- 6) The H.E.P.A. filter is the primary and most critical of the five stage filtration system. Each H.E.P.A. filter is individually tested and certified to be a minimum of 99.99% efficient at 0.3 microns by the D.O.P. Test method.
- 7) A plastic bag is situated inside the tank for clean and easy disposal of the collection bag.
- 8) Clean air is exhausted allowing for a safer environment.



SPECIFICATIONS

Model #	Static Lift	C.F.M.	No. of Filters	Cord Length	Tank Material	Tank Size	Wet Cap.	Weight	Cart Assy.	H.E.P.A. (High Efficiency Particulate Air) filter meets or exceeds the following Military & Government specifications.
HDP0688	88"	95	5	30'	Steel	6 gal	n/a	29	Yes	
HD00688	88"	95	5	30'	S/S	6 gal	n/a	26	Opt.	MIL - F - 51079 MIL - F - 51068B U/L Listed
HW00688	88"	95	5	30'	S/S	6 gal	4 gal	39	Yes	

838 N. Iowa, Villa Park, Illinois 60181
 Telephone: 708-530-0558 FAX: 708-530-0740

NIKRO

INDUSTRIES, INC. • 638 N. Iowa Street, Villa Park, Illinois 60181 • (708) 530-0558 • FAX (708) 530-0740

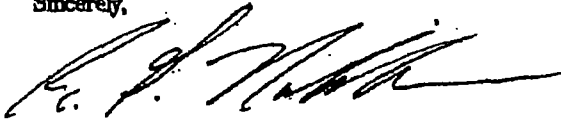
November, 1998

To Whom It May Concern:

This is to advise that all our Nikro H.E.P.A. filtered vacuums are built in accordance with and meet the ANSI Z9.2 Standards.

All of our H.E.P.A. filters are manufactured and D.O.P. Tested in accordance with MIL-STD 282 and UL586, and are registered and labeled on each individual unit by the manufacturer. All the filters we use meet, and in most cases, exceed the minimum standard of 99.97% efficiency for 0.3 micrometer particles.

Sincerely,



Roland G. Nicholson
President

BGN:hc

HEPA Vacuums

Exceed All EPA & OSHA Filtration Standards



Model 102ASB

Model 102ASB Vacuums

Our popular 2-horsepower 2-stage long-life motor makes this HEPA vacuum a true "work horse" for heavy duty service in professional abatement work. The 102ASB offers superior vacuum recovery, ranging from dry, light particulates, to wet, heavy debris. 102ASB12P is a heavy duty poly tank vacuum while the 102ASB DA is an adapter to be used on a steel drum.

Features:

- High efficiency "Drop-in" style HEPA filter individually certified to have a minimum efficiency of 99.99% at 0.3 microns (based on total D.O.P. tests)
- Air seal gasket between the motorhead and tanks forms a positive lock fit
- Polyester prefilter is located on the bottom of the HEPA filter, and is held firmly in place with Velcro fasteners
- A Dacron filter bag covers the entire spacer sleeve and HEPA filter for three-stage filtration. Dacron material sheds dust to maintain maximum vacuum efficiency.
- 25-foot power cord.

model	horse power	water lift	cfm	recovery wet	shipping weight	product code	list price
102ASB 12P	2	105"	110	12 gallon	73	B160421	\$ 1,100.00
102ASB DA*	2	105"	110	55 gallon	63	B160446	\$ 1,000.00

102ASB12P price includes complete tool kit.
*Drum not included

Tool kit included:

- 10' x 1.5" hose assembly
- 5' two-piece metal wand
- standard floor brush tool
- standard floor squeegee tool
- standard carpet tool
- standard round dusting brush
- standard crevice tool

(U) 102 model is U.L. approved

HEPA Vac Attachments

description	45 Dry			86 Dry			30 Dry			86/102 Wet/Dry		
	product code	list price	product code	list price	product code	list price	product code	list price	product code	list price	product code	list price
replacement tool kit	B160424	\$ 65.00	B160450	\$ 92.50	B160425	\$ 60.50	B160456	\$ 27.50				
10' x 1.5" hose assembly	B702361	\$ 21.30	B160451	\$ 25.00	B160457	\$ 25.00	B160458	\$ 25.00				
5' two-piece metal wand	B702364	\$ 21.00	B521007	\$ 33.40	B521007	\$ 33.40	B521007	\$ 33.40				
standard floor brush tool	B702365	\$ 12.50	B702365	\$ 14.90	B527005	\$ 19.90	B527005	\$ 19.90				
standard floor squeegee tool							B527004	\$ 19.90				
standard carpet tool	B702367	\$ 20.00	B527006	\$ 19.90	B527006	\$ 19.90	B527006	\$ 19.90				
standard round dusting brush	B702363	\$ 3.30	B160452	\$ 9.50	B160453	\$ 9.50	B160454	\$ 9.50				
standard crevice tool	B702362	\$ 2.20	B702365	\$ 4.90	B702365	\$ 4.90	B702365	\$ 4.90				

HEPA Vac Accessories

description	45			86			30			102		
	product code	list price	product code	list price	product code	list price	product code	list price	product code	list price	product code	list price
HEPA filter	B702340	\$ 213.90	B524526	\$ 24.00	B702340	\$ 272.40	B702340	\$ 272.40	B702340	\$ 272.40		
spacer sleeve			B702341	\$ 12.50					B702341	\$ 12.50		
dacron filter bag	B160457	\$ 17.20	B160457	\$ 17.20					B160457	\$ 17.20		
prefilter			B527004	\$ 19.90					B527004	\$ 19.90		
disposable paper bag	B702342	\$ 11.00	B160458	\$ 11.00	B160458	\$ 11.00	B160458	\$ 11.00	B160458	\$ 11.00		
vac bag	B524526	\$ 3.00	B702341	\$ 12.50	B160458	\$ 11.00	B160458	\$ 11.00	B160458	\$ 11.00		
vac liner for bag							B160458	\$ 11.00				
vac liner for bag									B160458	\$ 11.00		
vac liner for bag									B160458	\$ 11.00		

All prices refer to each, unless otherwise stated.

PRODUCT DATA

FIBERSET® PM

DESCRIPTION

Product No.: 7470 white, 7475 clear, 7480 blue

Fiberset PM is a pre-mixed "lockdown" sealing treatment for microscopic residual fibers present after removal of asbestos containing material (ACM). Fiberset PM is a ready-to-use, class "A" fire rated coating that provides a flexible barrier over residual fibers to insure final air clearance. Fiberset PM and Fiberset FT are the only UL® classified (#R13770) lockdowns accepted for fluted, cellular and corrugated deck assemblies. Fiberset PM is compatible with most leading brands of replacement fireproofing and flooring adhesives. Fiberset PM can also be used to penetrate asbestos contaminated soil in crawl spaces. Fiberset PM is a water based nontoxic coating which employs advanced 100% acrylic resin technology to extend the life expectancy of airless spray equipment.

UL Classification: ASTM E-119

UL Category: Encapsulant Materials

PROPERTIES

- Volatile: Water
- Average particle size: 0.2 microns
- Viscosity @ 77°F: 55-60 Krebs Units
- Weight per gallon @ 77°F: 8.5 lbs.
- Film Hardness: Excellent
- Film Flexibility: Excellent
- Impact Resistance: Excellent
- Water resistance of dry film: Excellent
- Bond Strength to concrete/steel: Excellent
- Coverage: not less than 500 sq. ft./gal.
(as specified by UL)
- Flash point: Tag Closed Cup, Non-combustible water based product.
- Dry Time 1 - 2 hours
- Shelf Life: @ 77°F, 36 months minimum, (in original factory sealed containers).
- Odor: virtually odorless.
- Finish: slight gloss
- Packaged: 5, and 55 gallon containers



APPLICATION INFORMATION

LOCKDOWN: Sealing microscopic residual fibers after asbestos removal is mandatory on every project. Prior to post-removal air monitoring, apply one coat to all exposed surfaces. Fiberset PM has been accepted as part of a UL Classified Fireproofing System for use with Retro-Guard® manufactured by W.R. Grace & Co., Conn.

PULLDOWN BY MISTING: Pulldown by misting the contaminated air is an effective technique prior to post removal air-monitoring. To pull down free-floating asbestos fibers effectively, stand in the center of the room and hold the spray gun as close to the ceiling as possible. A mist should be sprayed parallel to the ceiling in every direction or in a circle. Apply one coat to the polyethylene walls and floor.

(Over)



FIBERLOCK TECHNOLOGIES, INC.

150 Dascomb Road
Andover, MA 01810 U.S.A.
Toll Free: (800) 342-3755
Tel: (978) 623-9987 Fax: (978) 475-6205
www.fiberlock.com

APPLICATION PROCEDURES FOR FIBERSET PM

PREPARATION

Prior to application, stir thoroughly to achieve a uniform consistency. Fiberset PM is pre-mixed, water addition is not necessary.

APPLICATION EQUIPMENT

Professional models of all brands of spray equipment can be used to successfully apply Fiberset PM. Use the settings below when applying Fiberset PM:

Pressure: 2500-2700 psi
Hose length: 100 feet
Hose diameter: 1/4 inch
Tip size: .015 - .025 (orifice size)
Fan size: 12 inches

CLEAN UP

Tools and drippings should be cleaned with soap and water before coating dries.

SHIPPING AND STORAGE INFORMATION

Shelf Life: 3 years in sealed containers

Storage Temperature: Keep from freezing. Store in a dry place at temperatures between 40°F - 100°F

Flash Point: None.

Note: Fiberset PM is part of a UL Classified Fireproofing System for use with Classified types RG and RG1 cementitious mixtures manufactured by Zenolite Construction Products Division W.R. Grace & Co., Conn.

**KEEP OUT OF REACH OF CHILDREN
FOR PROFESSIONAL USE ONLY
KEEP FROM FREEZING**

Caution: Approved respirators must be used to prevent inhalation of asbestos fibers that may be present in the air. Protective clothing should be worn. Tools and drippings should be cleaned immediately with clean, soapy water before the coating dries. Careful consideration should be given to all Environmental Protection Agency (EPA), OSHA and state regulations in effect at the time of application of Fiberset PM. The EPA, through the Office of Pesticides and Toxic Substances has issued reports headed "Guidance for Controlling Friable Asbestos-Containing Materials in Buildings," EPA 560/5 85-024, June 1985, and "Managing Asbestos in Place, A Building Owner's Guide to Operations and Maintenance Programs for Asbestos Containing Materials," 201-2003, July 1990, containing the proper data, cautions, and procedures for asbestos control. Copies are available from the Environmental Assistance Division, TS-799, TSCA Assistance Information Service, U.S. EPA, 401 M Street SW, Washington, DC 20460, (202) 554-1404.

Keep from freezing. Do not store at temperatures above 100°F.

These suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of use of this product are beyond our control. Neither Fiberlock Technologies, Inc., nor our agents shall be responsible for the use or results of use of this product or any procedures or apparatus mentioned. We recommend that the prospective user determine the suitability of Fiberset PM for each specific project and for the health and safety of personnel working in the area.

PRODUCT DATA

PENEWET®

DESCRIPTION

Product No.: 6450 clear

Penewet is an ready-to-use, colorless wetting agent/surfactant solution incorporating advanced concepts in surface chemistry. It provides powerful wetting, penetrating and coalescing of asbestos containing materials (ACM) to permit handling and removal of these materials under damp, dust-free conditions. Penewet is a nonflammable water based nontoxic liquid which will not corrode aluminum components of spray equipment.

PROPERTIES

- Solids by Weight: 10 +/-2%
- Volatile: Water
- Average particle size: 0.2 microns
- Viscosity @ 77°F: 50-55 Krebs Units
- Weight per gallon @ 77°F: 8.8 lbs.
- Ionic nature: Non-ionic
- Flammability: Non-flammable
- Phosphate free?: Yes
- Surface tension: 31 dynes/cm.
- Coverage: 500 sq.ft./gal.
- Shelf Life: @ 77°F, 36 months minimum, (in original factory sealed containers).
- Odor: Applied indoors, virtually odorless.
- Packaged: 5, and 55 gallon containers

APPLICATION INFORMATION

SURFACTANT/WETTING AGENT: Penewet is a ready-to-use formulation. Sealing microscopic residual fibers after asbestos removal is mandatory on every project. Prior to post-removal air monitoring, apply one coat to all exposed surfaces prior to post removal air monitoring.

PULLDOWN BY MISTING: Pulldown by misting the contaminated air is an effective technique prior to post removal air-monitoring. To pull down free-floating asbestos fibers effectively, stand in the center of the room and hold the spray gun as close to the ceiling as possible. A mist should be sprayed parallel to the ceiling in every direction or in a circle. Apply one coat to the polyethylene walls and floor.

(Over)



FIBERLOCK TECHNOLOGIES, INC.

150 Dascomb Road
Andover, MA 01810 U.S.A.
Toll Free: (800) 342-3755
Tel.: (978) 623-9987 Fax: (978) 475-6205
www.fiberlock.com

Appendix G
Air Monitoring Plan

IRS ENVIRONMENTAL, INC.
ASARCO Phase 4 Building Cleaning and Demolition
Personal Air Monitoring Plan – Asbestos Removal

LABORATORY SERVICES

Mountain Inspection and Laboratory Services, Inc.
9922 E. Montgomery Ave. # 13
Spokane, WA 99206
(509) 922-1365
(509) 922-1380

Mountain Inspection and Laboratory Services, Inc. has a fully qualified professional staff to conduct air sample analysis for airborne asbestos. This project involves the removal of the following Class I and II materials:

- TSI – Pipe insulation fittings
- CAB – Cement Asbestos Board
- Vinyl floor tile and sub flooring
- Window caulking
- Millboard
- Gaskets Materials

Air sampling to be performed

- Personnel Air Sampling to complete exposure assessments.

Mountain Inspection and Laboratory Services, Inc will perform laboratory analysis using Phase Contrast Microscopy (PCM) in accordance with NIOSH Method 7400A. Visual Inspections to document work in progress and compliance with the specifications shall be conducted by IRSE Competent Person on a daily or as needed basis. Daily project logs shall include descriptions of the work being performed, personnel onsite, hours worked, percentage of work completed, problems encountered, and information regarding air sampling and analysis.

ABATEMENT PROJECT MONITORING

Personnel monitoring shall be conducted as needed to collect minimum liters per sample requirements. Monitoring will commence with the first asbestos disturbance and continue until an exposure assessment for each removal activity: *Removal of pipe covering using glove bag methods, removal of CAB using wet manual methods, flooring removal using wet manual methods, window caulking, roofing material and metalbestos siding.*

Sample Location

Sample Quantity

Work Area-Personnel

Two samples per day for each removal activity.

Work Area-Personnel Excursion

One sample per day for each activity

Outside Work Area

One sample per day at each Air Filtration Device (AFD) Exhaust.

1. Calibration of pumps - Conducted prior to, and after the proper run time for the samples has been achieved. A hand held rotometer, calibrated to a Buck Gilibrator once every six months will be utilized for calibration of high volume pumps.
2. Setting of pumps - The pumps will be placed in the breathing zone of the most contaminated worker performing each task, to provide the best overall representation of the exposure involved.
3. Personnel sampling - a minimum of 280 total liters of air will be collected per sample. (60 liters for Personnel excursion) Samples will be collected from the breathing zone of the most contaminated worker through a 25 mm Mixed Cellulose Ester (MCE) filter at flow rates between five (2) and (3) liters per minute.
4. Analysis - Mountain Inspection and Laboratory Services, Inc. personnel will analyze the air samples off site at Mountain Inspection and Laboratory Services, Inc., a NVLAP Certified Facility. The air samples will be analyzed for fiber content and concentration (fibers per square millimeter of filter area, and fibers per cubic centimeter of air sampled) using NIOSH method 7400, "Fibers", August 15, 1987 revision.
5. Final Report - A comprehensive final report detailing the analytical results of the samples collected will be provided to MCS Environmental for review. Sample Results shall be reported to two decimal places or the quantification limit for the type of sample collected. Actual fiber levels may be included in the report, however, two decimal place accuracy shall be used for determining work practice modifications, stop work requirements, and clearance results. Sample results less than .01 shall be reported as <0.01 within the air monitoring reports.

Appendix H
Respirator Protection Program

IRS ENVIRONMENTAL RESPIRATORY PROTECTION PROGRAM

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1.0 Introduction

It is the policy of IRS Environmental to provide and maintain a safe and healthful work place for all employees. To that end, IRS Environmental has developed this program for the selection, use and care of respiratory protection. This respirator protection program has been written to be consistent with all required Federal and State requirements.

2.0 Respirator Policy

Company personnel will use respiratory protection equipment where reasonable engineering controls and chemical substitution cannot minimize respiratory hazards. Engineering controls such as ventilation and substitution of less toxic materials are the first line of defense. However, engineering controls have not always been feasible for some of our operations or have not always completely controlled the identified hazards. In these situations, respirators and other protective equipment must be used.

This program applies to all employees who are required to wear respirators during normal work operations and during certain non-routine operations. Employees participating in the respiratory protection program do so at no cost to them. The expense associated with medical evaluations, training, and respiratory protection equipment will be borne by the Company.

Appropriate respiratory protection shall be used by all employees working in environments that are oxygen deficient (below 19.5 percent by volume); oxygen enriched (greater than 21.5% by volume); or in atmospheres contaminated by dusts, mists, vapors, smoke, or fumes that may exceed the permissible exposure limits (PELs) as defined by WISHA or OSHA or more stringent limits set by a specific Health and Safety Plan.

3.0 References

State of Washington, Department of Labor and Industries, General Occupational Health Standards, WAC 296-62-071, Respiratory Protection.

American National Standards Institute, ANSI Z88.2 1980, Practices for Respiratory Protection.

Occupational Safety and Health Administration, Code of Federal Regulations, CFR 1910.134, New OSHA Respiratory Protection Standard.

4.0 Program Administration

4.1 Safety Coordinator

The Safety Coordinator is **Carl Burnham**. The Safety Coordinator shall be responsible for the development, coordination, and administration of the IRS Environmental Respiratory Protection Program. Specific responsibilities shall include:

1. Ensuring that the Company complies with State and Federal requirements.
2. Serving as an advisor to all levels of management on matters pertaining to respiratory protection.
3. Approving the purchase of all respiratory protection equipment.

4. Implementing and reviewing a written respiratory protection program in compliance with WISHA and OSHA requirements.
5. Initiating monitoring of work areas to evaluate potential respiratory hazards and maintaining records of monitoring activities.
6. Annual inspecting of departments to evaluate program effectiveness.
7. Ensuring all personnel wearing a respirator in a negative pressure mode have received a yearly medical evaluation which determines the physiological and psychological limitations of individual wearers.
8. Instituting and maintaining appropriate medical and biomedical surveillance programs as recommended by the licensed health care professional.
9. Implementing a change schedule for respirator cartridges based on published data, historic data, and frequency of use information.

4.2 On-site Supervisors

On-site Supervisors for each location shall be responsible for on-site compliance with the respiratory protection program requirements. Responsibilities shall include:

1. Ensuring that employees are provided proper respiratory protection equipment, as required.
2. Enforcing the proper use of such equipment where and when required.
3. Ensuring that employees are properly trained in the selection, care and use of respiratory protection equipment.
4. Ensuring proper maintenance and storage of respiratory protection equipment.

4.3 Employee Responsibility

Each employee has a definite responsibility in contributing to the success of the respiratory protection program. These responsibilities include:

1. Use of respiratory equipment in accordance with training and instructions received.
2. Guarding against damage to equipment.
3. Observing all safety rules and regulations pertaining to respiratory protection equipment.
4. Maintaining personal grooming habits conducive to proper wearing of respiratory protection equipment (no beards or facial hair that interferes with the face to facepiece seal).
5. Receiving a medical exam and fit-test prior to initial use of a respirator and annually thereafter.
6. Reporting any malfunction of equipment to his/her immediate supervisor.
7. Inform their supervisor or the Safety Coordinator of any respiratory hazards that they feel are not adequately addressed in the workplace and of any other concerns that they have regarding the program.
8. Notify their On-site Supervisor or the Safety Coordinator of any other problems associated with using their respirator.

5.0 Availability of Respirators

Each employee who wants, or is required to wear, a respirator will be issued one along with replacement parts, cartridges and filters, as needed. The selected types of respirators are available from the Safety Coordinator.

6.0 Selection and Use of Respirators

The following procedures shall be used for the selection and use of respiratory protection:

1. Respiratory protection selection will provide protection to a level of exposure below established permissible exposure limits (PEL) for identified hazardous substances and health hazards.
2. The Safety Coordinator or his/her designee will conduct a exposure assessments upon initial assignment for each operation, process, or work area where airborne contaminants may be present. Selection of respiratory protection for initial assignment will be as specified within Tables 6.1 and 6.2, or as specified within project specifications.
3. Company personnel will not enter areas where they will be exposed to hazardous substances or health hazards until the On-site Supervisor has determined the proper level of protection.
4. When respiratory protection is used, IRS Environmental personnel will not enter a site without proper positive/negative respiratory fit test as well as a current and valid qualitative/quantitative (whichever appropriate as determined by the Safety Coordinator) fit test. A current and valid qualitative/quantitative fit test means the test was successfully conducted within the past 12 months, the respirator being used is the same style, manufacturer, and size as used during fit testing, and as long as the employee has not incurred facial scarring, dental changes, cosmetic surgery, or obvious change in body weight.
5. Contact lenses may be worn with a respirator in contaminated atmospheres.
6. Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969 (A later edition of this standard, Z88.2-1980, has been issued).
7. The Safety Coordinator will ensure that respirators selected will not impair the worker's vision, hearing, communication, and physical movement necessary to perform jobs safely.
8. Until the On-site Supervisor has determined the proper level of protection, Company personnel are not to enter areas where the known

concentrations of any material create immediately dangerous to life and health (IDLH) conditions, the Oxygen concentration is below 19.5% or above 21.5%, a lower explosive limit of 10% is reached or exceeded, or there is any indication that the atmosphere may be contaminated by dusts, mists, vapors, smoke, or fumes that may exceed the permissible exposure limits (PELs).

9. Entry into confined spaces will not be allowed unless contaminant levels are known and the space is considered safe for entry. If the space is deemed a permit-required confined space, an entry permits must be issued before personnel are allowed to enter a confined space as per the IRS Environmental Confined Space Entry Program.
10. Company personnel working in areas where the workers, with failure of the respirator, could be overcome by a toxic or oxygen-deficient atmosphere will always work at least in pairs. Communication (visual, voice, or signal line) shall be maintained between both or all individuals present. It shall be planned that one individual will be unaffected by any likely incident and have the proper rescue equipment to be able to assist the other(s) in case of emergency.
11. The assigned respirator outlined in Tables 6.1 and 6.2 or protection factors in "WAC 296-62-07131, Table 1--Assigned Protection Factors" will be used when selecting respirators. Half-mask respirators can provide adequate protection for routine respirator use, where employee exposures do not exceed ten times the permissible exposure limit.

6.1 Respirator Selection Based Upon Exposure

Table 6.1 lists types of respirators available to employees. Each respirator listed has specified use limits for the hazardous contaminants encountered by IRS Environmental: asbestos and lead. For other contaminants other than asbestos and lead, the Safety Coordinator will select appropriate respiratory protection.

Table 6.1: Respirator Selection Table		
Brand/Type Respirator	Use Limits Asbestos	Use Limits Lead
North 7700, ½ Face Negative Pressure	1 f/cc	500 µg/m ³
North 76008A, Full Face Negative Pressure	5 f/cc	2,500 µg/m ³
Racal Powerflow, Full Face Powered Air Purifying	10 f/cc	5,000 µg/m ³
Neoterik SR-14, Full Face Powered Air Purifying	10 f/cc	5,000 µg/m ³
Neoterik 50366CF, Full Face Supplied Air, Constant Flow with HEPA Egress	100 f/cc	10,000 µg/m ³
North 85785, Full Face Supplied Air, Constant Flow with HEPA Egress	100 f/cc	10,000 µg/m ³

I.S.I Safee, Full Face, Supplied Air, Pressure Demand w/HEPA Egress	100+ f/cc	10,000 $\mu\text{g}/\text{m}^3$
North 85785, Full Face, Supplied Air, Pressure Demand w/HEPA Egress	100+ f/cc	10,000 $\mu\text{g}/\text{m}^3$

6.2 Respirator Selection – Activity Specific Respirators are required for all employees engaged in the tasks listed in Table 6.2(A) and 6.2(B). The expected concentration range of asbestos (Table 6.2(A)) and lead (Table 6.2(B)) for each activity is shaded. Exposure ranges for some activities are wide due to hazardous constituent content of the material, work practices used, and engineering controls instituted. IRS Environmental will supply respirators for the highest concentration listed for each activity. IRS Environmental has established the following exposure data and/or consulted regulatory guidance to develop the listed activities' expected airborne concentrations. As these activities continue to be assessed and new activities are initially assessed, the Safety Coordinator will amend this section as needed.

Table 6.2(A): Respirator Selection Table - ASBESTOS

Removal Activity	0-1 f/cc	1-5 f/cc	5-10 f/cc	10-100 f/cc
Blanket Insulation ¹				
Boiler Insulation ¹				
Boiler Breaching ¹				
Cement Asbestos Board				
Ceiling Tile				
Caulking				
Duct Tape				
Duct Covering ¹				
Floor Tile - Manual				
Mastic - Manual				
Mastic - "Blastrak"				
Flex Gaskets on Ducts				
Hard Pipe Fittings, Glovebag				
Hard Pipe Fittings, No Glovebag				
Linoleum Felt Backing				
Pipe Insulation "Aircell" - Glovebag				
Pipe Insulation "Aircell" - No Glovebag				
Pipe Insulation - Contained Block				
Roofing - Asphalt Impregnated				
Roofing - Felt				
Spray Texture - "Popcorn" ¹				
Structural Fireproofing - Hard ¹				
Structural Fireproofing - Loose ¹				
Rope Material				
Tank Insulation - Block				
Tank Insulation - "Aircell"				
Wall Board				
Window Glazing				

¹ Minimum respiratory requirement in Washington State is at least full face, supplied air, constant flow.

Table 6.2(B): Respirator Selection Table - LEAD

Removal Activity	0 - 500 µg/m ³	501-2,500 µg/m ³	2,501+ µg/m ³
Open Abrasive Blast Cleaning with Expendable Abrasives			
Open Abrasive Blast Cleaning with Recyclable Abrasives			
Torch Cutting			
Torch Burning			
Welding			
Using Lead Containing Mortar			
Lead Burning			
Rivet Busting			
Mechanical Cleaning (with Power Tools)			
Cleanup of Abrasive Blast Cleaning with Expendable Abrasives			
Abrasive Blast Enclosure Movement			

Appendix I

Site Layout



Appendix J
Laboratory Certifications

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:1999

NVLAP LAB CODE: 101890-0

Mountain Laboratories
Spokane, WA

*is recognized by the National Voluntary Laboratory Accreditation Program for conformance with criteria set forth in
NIST Handbook 150:2001 and all requirements of ISO/IEC 17025:1999.
Accreditation is granted for specific services, listed on the Scope of Accreditation, for:*

BULK ASBESTOS FIBER ANALYSIS

2006-10-01 through 2007-09-30

Effective dates



Sally S. Bruce
For the National Institute of Standards and Technology



Your Essential
Connection

11/15/2006

Karen Drader
Mountain Laboratories
9922 E. Montgomery
Suite 13
Spokane, WA 99206

Lab ID# 101129

Dear Karen,

Please find your laboratory's Industrial Hygiene Proficiency Analytical Testing (IHPAT) results for Round 167. The deadline for ordering a retest is December 1, 2006. IHPAT Round 168 sample kits will be mailed to laboratories around January 1, 2007. Your laboratory's data will be due by 11:59pm EST on February 1, 2007. The analytes for round 168 are:

- Metals – cadmium, chromium, lead
- Asbestos – amosite
- Silica – coal dust/talc
- Organics – methyl ethyl ketone (MEK), methyl isobutyl ketone (MIK)
- Diffusive – benzene, toluene, o-xylene

Please handle, store and analyze your laboratory's PAT samples in the same manner as routine client samples. To submit your laboratory's data, please visit the Proficiency Analytical Testing (PAT) page and click on the PAT Data Entry Portal:

<http://www.aiha.org/Content/LQAP/PT/pt.htm>

Your laboratory's password needed to access the PAT Data Entry Portal is provided in the upper right hand corner (next to your lab ID#) of the address label on the results submission form included with your PAT samples.

Print and save the confirmation page after submitting data via the AIHA PAT Data Entry Portal.

The AIHA Laboratory Quality Assurance Programs Policies and Application for AIHA accreditation are available on-line.

<http://www.aiha.org/Content/LQAP/documents/documents.htm>

Note: The Policies for 2006 comply with ISO/IEC 17025: 1999.

I encourage you to contact me with any feedback, questions or if you wish to contest your results at (703) 846-0797.

Sincerely,

Natasha Sekitoleko
PAT Data Specialist

Industrial Hygiene Proficiency Analytical Testing Results

This document contains three sub-reports relating to IHPAT Round 167. The first report contains your laboratory's results listed per contaminant, per sample. The second report contains your current and 2 previous test round performance respectively (where applicable), and the final report contains summary results for all laboratories for IHPAT round 167.

Testing Results for IHPAT Round 167

This part of the report contains your laboratory's results listed per contaminant, per sample.

Contaminant	Units	#	Result	Ref. Value	Lower Limit	Upper Limit	z-Score	Rating
Asbestos / Fibers (ASB)	f/mm2	1	216	262	128	442	-0.9	A
	f/mm2	2	81	101	49	170	-1.0	A
	f/mm2	3	144	188	92	319	-1.3	A
	f/mm2	4	101	98	48	166	0.1	A

Please note:

Reference value is the mean of the reference laboratories

Lower limit = reference value - 3 standard deviations

Upper limit = reference value +3 standard deviations

A: Acceptable Analysis; U: Unacceptable Analysis

Z-score = (reported result - reference value)/standard deviation

Note: The acceptability of reported results is based on upper and lower performance limits. This is why a reported result may appear unacceptable according to z-score, but be identified as acceptable.

Overall Performance Summary Concluding with 167

The following table contains your laboratory's current and 2 previous test rounds performance respectively (where applicable). For more information in regard to the determination of proficiency, please see Policy Module 6B, Section 6B.2 for IHPAT and Policy Module 6C Section 6C.2 for ELPAT Lead-in-Air located at: <http://www.aiha.org/Content/LQAP/documents/accredpolicymods.htm>

Sample	Round	Round Performance	Round Score	Proficiency Status - Three Round Score
Asbestos	165	4/4	Pass	
	166	4/4	Pass	
	167	4/4	Pass	P

Please note:

The denominators represent the total number of samples analyzed.

The numerators represent the number of acceptable results.

Pass: Round Score \geq 75% Fail: Round Score < 75%

P – Proficient; NP – Non-proficient.

A laboratory is rated proficient (P) for the associated FoT/Method(s), if the laboratory has a passing score for the applicable PT analyte class in two (2) of the last three (3) consecutive PT rounds. A laboratory is rated non-proficient (NP) for the applicable FoT/Method if the laboratory has failing scores for the associated PT analyte class in two (2) of the last three (3) consecutive PT rounds.

If a laboratory receives samples and does not report the data, the results will be treated as outliers.

Performance of all Labs for IHPAT Round 167

The following table contains aggregate results for all laboratories participating in IHPAT round 167.

Contaminant	#	Ref. Value	Std Dev	RSD (%)	Total Labs	Total Acceptable	Low Outlier	High Outlier
Cadmium (CAD)	1	0.00780	0.00040	5.1	196	186	6	4
	2	0.00420	0.00020	4.9	196	183	5	8
	3	0.01590	0.00081	5.1	196	191	4	1
	4	0.01170	0.00066	5.6	196	188	6	2
Lead (LEA)	1	0.0902	0.0046	5.1	197	193	3	1
	2	0.0607	0.0028	4.6	197	194	3	0
	3	0.1191	0.0057	4.7	197	195	2	0
	4	0.0312	0.0015	4.9	197	192	2	3
Zinc (ZIN)	1	0.0807	0.0044	5.4	195	187	5	3
	2	0.1196	0.0053	4.4	195	182	9	4
	3	0.1585	0.0083	5.2	195	185	8	2
	4	0.0412	0.0028	6.2	195	183	6	6
Silica (SIL)	1	0.1076	0.0215	20.0	58	56	2	0
	2	0.1588	0.0251	15.8	58	57	1	0
	3	0.0616	0.0123	20.0	58	57	0	1
	4	0.0838	0.0168	20.0	58	56	2	0
Asbestos / Fibers (ASB)	1	262	52	20.0	759	659	82	18
	2	101	20	20.0	759	644	47	68
	3	188	38	20.0	759	674	53	32
	4	98	20	20.0	759	703	29	27
Methanol (MOH)	1	0.7841	0.0749	9.6	157	148	5	4
	2	0.1154	0.0128	11.1	157	144	5	8
	3	0.2483	0.0262	10.5	157	149	2	6
	4	0.3467	0.0328	9.5	157	147	5	5

Appendix K
Material Safety Data Sheet (MSDS)

AMREP INC

-- HEAVY DUTY ADHESIVE

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MSDS Safety Information

=====

FSC: 8040
MSDS Date: 09/14/1992
MSDS Num: BXJBH
LIIN: 00N058978
Product ID: HEAVY DUTY ADHESIVE
MFN: 01
Responsible Party
Cage: 3V338
Name: AMREP INC
Address: 990 INDUSTRIAL PK DR
City: MARIETTA GA 30062
Info Phone Number: 404-422-2071
Emergency Phone Number: 800-255-3924
Preparer's Name: ES/KD
Published: Y

=====

Contractor Summary

=====

Cage: 3V338
Name: AMREP INC
Address: 990 INDUSTRIAL PK DR
City: MARIETTA GA 30062-2433
Phone: 404-422-2071

=====

Ingredients

=====

Cas: 67-64-1
RTECS #: AL3150000
Name: ACETONE (SARA 313) (CERCLA)
% Wt: 30-40
OSHA PEL: 1000 PPM
ACGIH TLV: 750PPM/1000STEL
EPA Rpt Qty: 5000 LBS
DOT Rpt Qty: 5000 LBS

Cas: 110-54-3
RTECS #: MN9275000
Name: HEXANE (CERCLA)
% Wt: 10-15
OSHA PEL: 500 PPM
ACGIH TLV: 50 PPM
EPA Rpt Qty: 1 LB
DOT Rpt Qty: 1 LB

Cas: 75-28-5
RTECS #: TZ4300000
Name: PROPANE, 2-METHYL-; (ISOBUTANE)
% Wt: 40-45
OSHA PEL: 1000 PPM (MFR)
ACGIH TLV: 1000 PPM (MFR)

=====

Health Hazards Data

=====

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route Of Entry Inds - Inhalation: YES

Skin: YES

Ingestion: NO

Carcinogenicity Inds - NTP: NO

IARC: NO

OSHA: NO

Effects of Exposure: ACUTE: INHAL: EXCESSIVE INHAL OF VAPS CAN CAUSE NASAL

& RESP IRRIT, DIZZ, WEAK, NAUS, HDHC, POSS UNCON/ASPHYXIATION. EYES: IRRIT. SKIN: IRRIT DUE TO DEFAT OF SKIN. INGEST: POSS CHEM PNEUMIT IF ASPIRED

INTO LUNGS. CHRONIC: EXCESSIVE INHAL OF HEXANE MAY CAUSE NERVE DMG. Explanation Of Carcinogenicity: NOT RELEVANT.

Signs And Symptions Of Overexposure: SEE HEALTH HAZARDS.

Medical Cond Aggravated By Exposure: MAY AGGRAVATE EXISTING EYE, SKIN, OR UPPER

RESPIRATORY CONDITIONS.

First Aid: EYES: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. IF IRRITATED, SEE

MD. SKIN: WASH WITH SOAP AND WATER. IF IRRITATED, SEE MD. INHAL: REMOVE TO

FRESH AIR. RESUSCITATE IF NECESSARY. GET MEDICAL AID. INGES T: DO NOT INDUCE

VOMITING. CALL MD IMMEDIATELY.

Handling and Disposal

Spill Release Procedures: ABSORB WITH SUITABLE MEDIUM.

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Methods: INCINERATE OR LANDFILL ACCORDING TO LOCAL, STATE, AND

FEDERAL REGULATIONS. DO NOT FLUSH INTO SEWERS. AEROSOL CANS WHEN VENTED TO

ATMOSPHERIC PRESSURE THROUGH NORMAL USE, POSE NO DISPOSAL HAZARD.

Handling And Storage Precautions: DO NOT PUNCTURE OR INCINERATE CONTAINERS. DO

NOT STORE AT TEMPERATURES ABOVE 130F.

Other Precautions: AVOID FOOD CONTAMINATION. KEEP OUT OF REACH OF CHILDREN.

REMOVE IGNITION SOURCES. AVOID BREATHING VAPORS.

Fire and Explosion Hazard Information

Flash Point Text: FLAMMABLE

Extinguishing Media: FOAM, DRY CHEMICAL, CARBON DIOXIDE, WATER.

Fire Fighting Procedures: WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP (FP

N). USE WATER FOG TO COOL CONTRS TO PREVENT RUPTURING & EXPLODING CONTRS.

PROVIDE SHIELDING FOR PERSONNEL.

Unusual Fire/Explosion Hazard: EXTREMELY FLAMMABLE. DO NOT EXPOSE AEROSOLS TO

TEMPERATURES ABOVE 130F OR THE CONTAINER MAY RUPTURE.

Control Measures

Respiratory Protection: IF VAPOR CONCENTRATION EXCEEDS TLV, USE
NIOSH/MSHA

APPROVED RESPIRATOR IN POSITIVE PRESSURE MODE.

Ventilation: ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATION BELOW
TLV.

Protective Gloves: NEOPRENE GLOVES.

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (FP N).

Other Protective Equipment: NONE.

Work Hygienic Practices: WASH WITH SOAP AND WATER BEFORE HANDLING FOOD.
REMOVE

CONTAMINATED CLOTHING.

Supplemental Safety and Health: NONE SPECIFIED BY MANUFACTURER.

Physical/Chemical Properties

Vapor Pres: 80 PSIG

Spec Gravity: 0.853 (H*20=1)

Solubility in Water: PARTIAL

Appearance and Odor: STRAW COLORED LIQUID, WITH KETONE SOLVENT ODOR

Reactivity Data

Stability Indicator: YES

Stability Condition To Avoid: OPEN FLAME, WELDING ARCS, HEAT, SPARKS.

Materials To Avoid: STRONG OXIDIZING AGENTS.

Hazardous Decomposition Products: CARBON DIOXIDE, CARBON MONOXIDE.

Hazardous Polymerization Indicator: NO

Conditions To Avoid Polymerization: NOT RELEVANT.

Toxicological Information

Ecological Information

MSDS Transport Information

Regulatory Information

Other Information

HAZCOM Label

Product ID: HEAVY DUTY ADHESIVE

Cage: 3V338

Company Name: AMREP INC

Street: 990 INDUSTRIAL PK DR

City: MARIETTA GA

Zipcode: 30062-2433

Health Emergency Phone: 800-255-3924

Label Required IND: Y

Date Of Label Review: 04/20/1995

Status Code: C

Label Date: 04/20/1995

Origination Code: G
Chronic Hazard IND: Y
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: DANGER
Respiratory Protection IND: YES
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: Severe
Reactivity Hazard: None
Hazard And Precautions: EXTREMELY FLAMMABLE. ACUTE: INHAL: EXCESSIVE
INHALATION
OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS,
WEAKNESS,
NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS OR ASPHYXIATION. EYES: IRR
ITATION. SKIN: IRRITATION DUE TO DEFATTING OF SKIN. INGEST: POSSIBLE
CHEMICAL
PNEUMONITIS IF ASPIRED INTO LUNGS. CHRONIC: EXCESSIVE INHALATION OF
HEXANE
MAY CAUSE NERVE DAMAGE.

=====

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Defense.

The United States of America in no manner whatsoever expressly or
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warrants, states, or intends said information to have any
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Defense

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verify

and assume responsibility for the suitability of this information to
their

particular situation regardless of similarity to a corresponding
Department

of Defense or other government situation.

Material Safety Data Sheet

Section 1 Product and Company Identification

Product Name: Duct Tape

Revision #: 2.3 Date Prepared: June 3, 1993 Date Revised: September 16, 1998

Manufacturer:

Supplier/Importer:

LA-CO INDUSTRIES, Inc./Markal Co.

1201 Pratt Blvd.

Elk Grove Village, IL, USA

60007-5746

Information Telephone: 847-956-7600

Emergency Telephone: Call CHEMTREC

USA 800-424-9300

International (Call Collect) 1-703-527-3887

Chemical Formula: Mixture

Section 2 Labeling

HMIS: 010

NFPA: 110

WHMIS (CANADA): NONE

EPA HAZARDS: NONE

Section 3 Hazardous Ingredients

NO INGREDIENTS CONSIDERED HAZARDOUS UNDER OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200.

AN INERT TAPE COMPOSED OF COTTON CLOTH AND POLYETHYLENE SHEETING WITH A CALENDERED RUBBER ADHESIVE SYSTEM. NO FUMES WILL RESULT FROM THE PROPER USE OF THIS TAPE.

Section 4 Physical/Chemical Characteristics

BOILING POINT: N.A.

SPECIFIC GRAVITY (H₂O=1): N.A.

VAPOR PRESSURE (mmHg): N.A.

VAPOR DENSITY (AIR=1): N.A.

MELTING POINT: N.A.

SOLUBILITY IN WATER: N.A.

EVAP. RATE (butyl acetate=1): N.A.

APPEARANCE: SILVER TAPE

Product Name: Duct Tape
Revision #: 2.3 Date Prepared: June 3, 1993 Date Revised: September 16, 1998

Section 5 Fire and Explosion Hazard Data

FLASH POINT (method used): N.A.

FLAMMABLE LIMITS:

LEL: N.A.

UEL: N.A.

EXTINGUISHING MEDIA: N.A.

SPECIAL FIRE FIGHTING PROCEDURES: N.A.

UNUSUAL FIRE AND EXPLOSION HAZARDS: N.A.

Section 6 Reactivity Data

STABILITY: STABLE

CONDITIONS TO AVOID: N.A.

INCOMPATIBILITY (MATERIALS TO AVOID): N.A.

HAZARDOUS DECOMPOSITION PRODUCTS: OXIDES OF CARBON IF BURNED.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: N.A.

Section 7 Health Hazard Data

ROUTES OF ENTRY:

INHALATION? NO

SKIN? NO

INGESTION? NO

HEALTH HAZARDS: NONE

CARCINOGENICITY:

NTP? NO

IARC? NO

OSHA? NO

SIGNS AND SYMPTOMS OF EXPOSURE: N.A.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: N.A.

EMERGENCY AND FIRST AID PROCEDURES: N.A.

Section 8 Precautions For Safe Handling and Use

RELEASE AND SPILL PROCEDURES: SOLID FINISHED PRODUCT DOES NOT LEAK OR SPILL

WASTE DISPOSAL METHOD: N.A.

HANDLING AND STORAGE PRECAUTIONS: N.A.

OTHER PRECAUTIONS: N.A.

Section 9 Control Measures

RESPIRATORY PROTECTION: N.A.

Product Name: Duct Tape
Revision #: 2.3 **Date Prepared:** June 3, 1993 **Date Revised:** September 16, 1998

VENTILATION:

LOCAL EXHAUST: N.A.
SPECIAL: N.A.
MECHANICAL (GENERAL): N.A.
OTHER: N.A.

PROTECTIVE GLOVES: N.A.

EYE PROTECTION: N.A.

OTHER PROTECTIVE EQUIPMENT: N.A.

WORK/HYGIENIC PRACTICES: N.A.

Section 10	Other Information
-------------------	--------------------------

MSDS Prepared By: Director of Chemical Safety

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA AVAILABLE TO US AND IS ACCURATE AND RELIABLE TO THE BEST OF OUR KNOWLEDGE AND BELIEF. HOWEVER, LA-CO INDUSTRIES, INC. MAKES NO REPRESENTATIONS AS TO ITS COMPLETENESS OR ACCURACY. INFORMATION IS SUPPLIED ON CONDITION THAT PERSONS RECEIVING SUCH INFORMATION WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR PURPOSES PRIOR TO USE. IN NO EVENT WILL LA-CO INDUSTRIES, INC. BE RESPONSIBLE FOR DAMAGES OF ANY NATURE WHATSOEVER RESULTING FROM THE USE OF OR RELIANCE UPON THE INFORMATION CONTAINED HEREIN.

POLY-AMERICA INC
EDGING

-- POLYETHYLENE SHEETING/BAGS/LAWN

=====

MSDS Safety Information

=====

FSC: 6850
MSDS Date: 05/01/1995
MSDS Num: BZDHP
LIIN: 00F047749
Product ID: POLYETHYLENE SHEETING/BAGS/LAWN EDGING
MFN: 01
Responsible Party
Cage: 66830
Name: POLY-AMERICA INC
Address: 2000 W MARSHALL DR
City: GRAND PRAIRIE TX 75051-2795
Info Phone Number: 214-647-4374
Emergency Phone Number: 214-647-4374
Review Ind: Y
Published: Y

=====

Preparer Co. when other than Responsible Party Co.

=====

Cage: 66830
Name: POLY-AMERICA INC
Address: 2000 W MARSHALL DR
City: GRAND PRAIRIE TX 75051-2795

=====

Contractor Summary

=====

Cage: 66830
Name: POLY-AMERICA INC
Address: 2000 W MARSHALL DR
City: GRAND PRAIRIE TX 75051-2795
Phone: 214-647-4374

=====

Ingredients

=====

Name: POLYETHYLENE COPOLYMER

Name: POLYETHYLENE HOMOPOLYMER

=====

Health Hazards Data

=====

Route Of Entry Inds - Inhalation: NO
Skin: NO
Ingestion: YES
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: EYES: SOLID/DUST MAY CAUSE IRRITATION/CORNEAL INJURY.
SKIN: NEGLIGIBLE HAZARD. INHALATION: NEGLIGIBLE HAZARD AT AMBIENT TEMPERATURE. INGESTION: MINIMAL TOXICITY.
Explanation Of Carcinogenicity: NONE
Signs And Symptoms Of Overexposure: EYES: SOLID/DUST MAY CAUSE

IRRITATION/CORNEAL INJURY. SKIN: NEGLIGIBLE HAZARD. INHALATION:
NEGLIGIBLE

HAZARD AT AMBIENT TEMP. INGESTION: MINIMAL TOXICITY.
First Aid: SKIN: MOLTEN PLASTIC SHOULD BE TREATED W/COLD WATER BEFORE
PLASTIC
IS REMOVED, THEN WRAP IN CLEAN GAUZE. OBTAIN MEDICAL ATTENTION IN ALL
CASES.

=====
Handling and Disposal
=====

Spill Release Procedures: NON-HAZARDOUS, DEGRADE VERY SLOWLY & MAY
BECOME A

NUISANCE. RECYCLE OLD/UNUSED PLASTIC WHEN POSSIBLE.
Waste Disposal Methods: DISPOSE OF IAW/FEDERAL, STATE & LOCAL
REGULATIONS.

=====
Fire and Explosion Hazard Information
=====

Flash Point Text: 600-650F
Extinguishing Media: WATER
Fire Fighting Procedures: USE WATER TO COOL SURFACES. OTHER TYPES OF
EXTINGUISHERS MAY BE USED. USE NIOSH APPROVED SCBA IN ENCLOSED AREAS.
STATIC
DISCHARGE CAN BE GENERATED. (SEE SUPP)

=====
Control Measures
=====

Respiratory Protection: NONE
Ventilation: NONE
Protective Gloves: NONE
Eye Protection: NONE
Other Protective Equipment: NONE

=====
Physical/Chemical Properties
=====

Solubility in Water: INSOLUBLE
Appearance and Odor: THIN SOLID FILM/SHEET W/NO ODOR.

=====
Reactivity Data
=====

Stability Indicator: YES
Stability Condition To Avoid: TEMP >572F.
Materials To Avoid: NONE
Hazardous Decomposition Products: CO2, HYDROGEN DIOXIDE & UNDER LEAN
OXYGEN

CONDITIONS, CO.
Hazardous Polymerization Indicator: NO

=====
Toxicological Information
=====

=====
Ecological Information
=====

=====
MSDS Transport Information
=====

Regulatory Information

Other Information

HAZCOM Label

Product ID: POLYETHYLENE SHEETING/BAGS/LAWN EDGING

Cage: 66830

Company Name: POLY-AMERICA INC

Street: 2000 W MARSHALL DR

City: GRAND PRAIRIE TX

Zipcode: 75051-2795

Health Emergency Phone: 214-647-4374

Label Required IND: Y

Date Of Label Review: 12/16/1998

Status Code: C

Label Date: 12/16/1998

Origination Code: G

Hazard And Precautions: EYES: SOLID/DUST MAY CAUSE IRRITATION/CORNEAL INJURY.

SKIN: NEGLIGIBLE HAZARD. INHALATION: NEGLIGIBLE HAZARD AT AMBIENT TEMPERATURE. INGESTION: MINIMAL TOXICITY.

EYES: SOLID/DUST MAY CAUSE

IRRITATION/CORNEAL INJURY. SKIN: NEGLIGIBLE HAZARD. INHALATION: NEGLIGIBLE

HAZARD AT AMBIENT TEMP. INGESTION: MINIMAL TOXICITY.

Disclaimer (provided with this information by the compiling agencies):
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information is formulated for use by elements of the Department of Defense.

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warrants, states, or intends said information to have any application, use or

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United States of America should seek competent professional advice to verify

and assume responsibility for the suitability of this information to their

particular situation regardless of similarity to a corresponding Department

of Defense or other government situation.

FIBERLOCK TECHNOLOGIES INC -- FIBERSET FT & FIBERSET PM, 7470

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MSDS Safety Information

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FSC: 8010
MSDS Date: 03/29/1994
MSDS Num: CERTX
LIIN: 00N049779
Product ID: FIBERSET FT & FIBERSET PM, 7470
MFN: 02
Responsible Party
Cage: 0JYL9
Name: FIBERLOCK TECHNOLOGIES INC
Address: 630 PUTNAM AVE
City: CAMBRIDGE MA 02139-0802
Info Phone Number: 617-876-8020
Emergency Phone Number: 617-876-8020;800-255-3924
Published: Y

=====

Contractor Summary

=====

Cage: 0JYL9
Name: FIBERLOCK TECHNOLOGIES INC
Address: 630 PUTNAM AVE
Box: 390432
City: CAMBRIDGE MA 02139-0802
Phone: 617-876-8020

=====

Ingredients

=====

Name: NON-HAZARDOUS INGREDIENTS
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

=====

Health Hazards Data

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LD50 LC50 Mixture: LD50:(ORAL,RAT) >5.0 G/KG
Route Of Entry Inds - Inhalation: NO
Skin: NO
Ingestion: NO
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: ACUTE: INHALATION: VAPORS OR SPRAY MISTS MAY BE SLIGHTLY IRRITATING TO EYES, NOSE, THROAT, AND MUCOUS MEMBRANE OF RESPIRATORY TRACT,
PRODUCING SYMPTOMS OF HEADACHE AND NAUSEA IN POORLY VENTILATED AREA S. SKIN
CONT: PROLONGED OR REPEATED CONT W/COATING MAY CAUSE SLIGHT SKIN IRRITATION.
EYE CONT: DIRECT (EFTS OF OVEREXP)
Explanation Of Carcinogenicity: NOT RELEVANT.
Signs And Symptions Of Overexposure: HLTH HAZ: CONTACT; INCONSEQUENTIAL EYE IRRITATION. INGESTION: MAY CAUSE NAUSEA AND INTENDED EXPECTORATION.
Medical Cond Aggravated By Exposure: NONE SPECIFIED BY MANUFACTURER.

First Aid: INHAL: REMOVE TO FRESH AIR. EYE CONT: IMMED FLUSH W/PLENTY OF WATER

FOR @ LST 15 MINS & CONSULT PHYS. SKIN CONT: WASH SKIN THOROUGHLY W/SOAP

& WATER. IF DRENCHED, REMOVE & WASH CLTHG BEFORE REUSE. ING EST: IF SWALLOWED, CALL PHYS IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH TO UNCONSCIOUS

PERSON. TREAT SYMPTOMATICALLY.

=====
Handling and Disposal
=====

Spill Release Procedures: KEEP UNNEC PEOPLE AWAY. FLOOR MAY BE SLIPPERY; USE

CARE TO AVOID FALLING. DIKE & CONTAIN MATL W/INERT MATL (E.G. SAND, EARTH). TRANSFER LIQUID TO CNTNRS FOR RECOVERY/DISP & SOLID DIKING MATL

TO SEPARAT E CNTNRS FOR DISP. KEEP SPILLS & CLEANING (SUPDAT)

Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.

Waste Disposal Methods: COATING & ANY CONTAMD DIKING MATL SHOULD BE THORO

AIR DRIED & COLLECTED INTO DRUMS. DRUMS SHOULD THEN BE SEALED & PROPERLY LBLD W/WASTE DESIGNATION & LANDFILL/INCINERATED ACCORDING TO CURRENT LOCAL, S TATE AND FEDERAL REGULATIONS.

Handling And Storage Precautions: MAX STORAGE TEMP 100F. KEEP CLOSURE TIGHT

& CONTAINER UPRIGHT TO PREVENT LEAKAGE. PRECAUTIONARY LABELING: "KEEP FROM FREEZING".

Other Precautions: DO NOT GET IN EYES. AVOID SKIN CONT. PVNT PRLNGD/RPTD BRTHG

OF VAPS/SPRAY MISTS. DO NOT HNDL UNTIL MFR'S SAFETY PRECAUTIONS & LABEL

INSTRUCTIONS HAVE BEEN READ & UNDERSTOOD. AVOID BREATHING SANDING DU ST.

=====
Fire and Explosion Hazard Information
=====

Flash Point Text: NON-COMBUSTIBLE

Extinguishing Media: MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).

Fire Fighting Procedures: USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).

Unusual Fire/Explosion Hazard: NONE SPECIFIED BY MANUFACTURER.

=====
Control Measures
=====

Respiratory Protection: NONE REQD IF GOOD VENT IS MAINTAINED. WEAR RESP (NIOSH-APPRVD/EQUIV) SUITABLE FOR CONCS & TYPES OF AIR CONTAMINANTS ENCOUNTERED. USE NIOSH APPRVD CHEMICAL/MECHANICAL FILTERS DESIGNED TO REMOVE

PARTICU LATES IN OPEN & RESTRICTED VENT (SUPDAT)

Ventilation: SUFFICIENT VENT, IN PATTERN & VOL, SHOULD BE PROVIDED TO KEEP

AIR CONTAMINANT CONC BELOW APPLIC EXPOSURE LIMITS. (SUPDAT)

Protective Gloves: IMPERVIOUS/NEOPRENE/RUBBER GLOVES.

Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).

Other Protective Equipment: ANSI APPRVD EYE WASH & DELUGE SHOWER (FP N). USE

DISPOSABLE/IMPERVIOUS CLTHG IF WORK CLTHG CONTAM IS LIKELY. (SUPDAT)

Work Hygienic Practices: WASH HANDS BEFORE EATING, SMKG/USING
WASHROOM.

FOOD/BEVERAGES SHOULD NOT BE CONSUMED ANYWHERE THIS PROD IS (SUPDAT)
Supplemental Safety and Health: SPILL PROC: RUN-OFFS OUT OF MUNICIPAL
SEWERS

& OPEN BODIES OF WATER. RESP PROT: AREAS. USE NIOSH APPRVD AIRLINE
TYPE

RESP/HOOD IN CONFINED AREAS. VENT: ALL APPLIC AREAS SHOULD BE
VENTILATED

I/A/W OSHA REG 29CFR PART 1910.94. OTHER PROT EQUIP: USE PROT CREAM
IF

PRLNGD SKIN CONT IS LIKELY. HYGIENE PRACT: BEING APPLIED.

=====

Physical/Chemical Properties

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B.P. Text: 212F,100C

M.P/F.P Text: >32F,>0C

Vapor Pres: 760 @ 100C

Vapor Density: HVR/AIR

Spec Gravity: 1.02 (FP N)

Evaporation Rate & Reference: SLOWER (BUTYL ACETATE =1)

Solubility in Water: COMPLETE

Appearance and Odor: LIQUID, SLIGHT ODOR.

=====

Reactivity Data

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Stability Indicator: YES

Stability Condition To Avoid: NONE SPECIFIED BY MANUFACTURER.

Materials To Avoid: AVOID CONTACT WITH: STRONG OXIDIZING AGENTS (E.G.
NITRIC

ACID, PERMANGANATES), ETC.

Hazardous Decomposition Products: SOME CARBON MONOXIDE.

Hazardous Polymerization Indicator: NO

Conditions To Avoid Polymerization: NOT RELEVANT.

=====

Toxicological Information

=====

Ecological Information

=====

MSDS Transport Information

=====

Regulatory Information

=====

Other Information

=====

HAZCOM Label

=====

Product ID: FIBERSET FT & FIBERSET PM, 7470

Cage: 0JYL9

Company Name: FIBERLOCK TECHNOLOGIES INC

Street: 630 PUTNAM AVE

PO Box: 390432

City: CAMBRIDGE MA
Zipcode: 02139-0802
Health Emergency Phone: 617-876-8020;800-255-3924
Label Required IND: Y
Date Of Label Review: 11/25/1997
Status Code: C
Label Date: 11/25/1997
Origination Code: G
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: CAUTION
Respiratory Protection IND: YES
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None
Hazard And Precautions: ACUTE: INHALATION: VAPORS OR SPRAY MISTS MAY BE
SLIGHTLY IRRITATING TO EYES, NOSE, THROAT, AND MUCOUS MEMBRANE OF
RESPIRATORY
TRACT, PRODUCING SYMPTOMS OF HEADACHE AND NAUSEA IN POORLY VENTILATED
AREA S.
SKIN CONT: PROLONGED OR REPEATED CONTACT WITH COATING MAY CAUSE
SLIGHT SKIN
IRRITATION. EYE CONT: DIRECT CONTACT; INCONSEQUENTIAL EYE IRRITATION.
INGESTION: MAY CAUSE NAUSEA AND INTENDED EXPECTORAT ION. CHRONIC:
NONE LISTED
BY MANUFACTURER.

=====

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information is formulated for use by elements of the Department of
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APPENDIX C

**STANDARD OPERATING PROCEDURES (SOP)
FOR SURFACE SOIL AND SUB-SURFACE
SOIL SAMPLE COLLECTION**

LIST OF STANDARD OPERATING PROCEDURES (SOP) FOR SURFACE SOIL AND SUBSURFACE SOIL SAMPLE COLLECTION

SOP/Form Number	Title	Key words
HF-SOP-2	Determination, Identification, and Description of Field Sampling Sites	Sampling
HF-SOP-4	Packing and Shipping Samples	Sampling
HF-SOP-5	Chain-of-Custody	Documentation
HF-SOP-7	Decontamination of Sampling Equipment	Decontamination
HF-SOP-29	Labeling and Documentation of Samples	Documentation
HF-SOP-31	Field Notebooks	Documentation
HF-SOP-58	Management and Validation of Field and Laboratory Data	Documentation
HS-SOP-6	Procedure For Collecting Surface Soil Samples	Soil
HS-SOP-13	Rinsate Blank Collection	Sampling
HS-SOP-57	Soil Sampling Procedure For Test Pits	Soil

APPENDIX D

FUMED SLAG ANALYTICAL DATA

May 02, 2005

Iver Johnson

MT DEQ

PO Box 200901

Helena, MT 59620

COPY

RECEIVED

MAY 05 2005

Dept. of Enviro. Quality
Waste & Underground
Tank Management Bureau

Workorder No.: H05040130

Project Name: ASARCO Slag Pile

Energy Laboratories Inc received the following 10 samples from MT DEQ on 4/14/2005 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H05040130-001	ASP01-B3	04/14/05 14:15	04/14/05	Solid	Metals by ICP/ICPMS, Total Mercury in Solid By CVAA Digestion, Total Metals Digestion, Mercury by CVAA
H05040130-002	ASP02-B5	04/14/05 14:21	04/14/05	Solid	Same As Above
H05040130-003	ASP03-B14	04/14/05 14:28	04/14/05	Solid	Metals by ICP/ICPMS, Total Chloride, Sulfate Mercury in Solid By CVAA Moisture Moisture Polychlorinated Biphenyls (PCB's) pH Digestion, Total Metals Digestion, Mercury by CVAA Saturated Paste Extraction Sonication Extraction Soil Sonication Extraction Semi-Volatile Organic Compounds, PAHs Volatile Organics, Methanol Extraction 8260-Volatile Organic Compounds - Short List
H05040130-004	ASP04-C4	04/14/05 14:37	04/14/05	Solid	Metals by ICP/ICPMS, Total Mercury in Solid By CVAA Digestion, Total Metals Digestion, Mercury by CVAA
H05040130-005	ASP05-C9	04/14/05 14:44	04/14/05	Solid	Metals by ICP/ICPMS, Total Chloride, Sulfate Mercury in Solid By CVAA Moisture Moisture Polychlorinated Biphenyls (PCB's) pH Digestion, Total Metals Digestion, Mercury by CVAA Saturated Paste Extraction Sonication Extraction Soil Sonication Extraction Semi-Volatile Organic Compounds, PAHs Volatile Organics, Methanol Extraction 8260-Volatile Organic Compounds - Short List

H05040130-007	ASP07-F3	04/14/05 14:57 04/14/05	Solid	Same As Above
H05040130-008	ASP08-G2	04/14/05 15:04 04/14/05	Solid	Metals by ICP/CPMS, Total Chloride, Sulfate Mercury in Solid By CVAA Moisture Moisture Polychlorinated Biphenyls (PCB's) pH Digestion, Total Metals Digestion, Mercury by CVAA Saturated Paste Extraction Sonication Extraction Soil Sonication Extraction Semi-Volatile Organic Compounds, PAHs Volatile Organics, Methanol Extraction 8260-Volatile Organic Compounds - Short List
H05040130-009	ASP09-G4	04/14/05 15:07 04/14/05	Solid	Metals by ICP/CPMS, Total Mercury in Solid By CVAA Digestion, Total Metals Digestion, Mercury by CVAA
H05040130-010	ASP10-H16	04/14/05 15:15 04/14/05	Solid	Same As Above

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative or Report.

If you have any questions regarding these tests results, please call.

Report Approved By:

Deborah K. Grumm

Client: MT DEQ
Project: A.SARCO Slag Pile
Lab ID: H05040130-001
Client Sample ID: ASP01-B3

Report Date: 05/02/05
Collection Date: 04/14/05 14:15
Date Received: 04/14/05
Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
METALS, TOTAL							
Antimony	34.9	mg/kg		5.0		SW6020	04/27/05 00:49 / rth
Arsenic	130	mg/kg		5.0		SW6020	04/27/05 00:49 / rth
Beryllium	ND	mg/kg		5.0		SW6010B	04/22/05 03:48 / jjw
Cadmium	3.1	mg/kg		1.0		SW6010B	04/20/05 19:24 / jjw
Chromium	60.8	mg/kg		5.0		SW6010B	04/20/05 19:24 / jjw
Cobalt	164	mg/kg		5.0		SW6010B	04/20/05 19:24 / jjw
Iron	196000	mg/kg	D	40		SW6010B	04/20/05 19:28 / jjw
Lead	134	mg/kg		5.0		SW6010B	04/20/05 19:28 / jjw
Manganese	11400	mg/kg		5.0		SW6010B	04/22/05 03:48 / jjw
Mercury	ND	mg/kg		1.0		SW7471A	04/25/05 13:51 / KC
Nickel	8.4	mg/kg		5.0		SW6010B	04/20/05 19:24 / jjw
Phosphorus	652	mg/kg		10		SW6010B	04/22/05 03:48 / jjw
Selenium	6.4	mg/kg		5.0		SW6020	04/27/05 00:49 / rth
Zinc	13200	mg/kg		5.0		SW6010B	04/20/05 19:28 / jjw

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-002
 Client Sample ID: ASP02-B5

Report Date: 05/02/05
 Collection Date: 04/14/05 14:21
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
METALS, TOTAL							
Antimony	46.7	mg/kg		5.0		SW6020	04/27/05 00:56 / rth
Arsenic	135	mg/kg		5.0		SW6020	04/27/05 00:56 / rth
Beryllium	ND	mg/kg		5.0		SW6010B	04/22/05 03:51 / jjw
Cadmium	4.1	mg/kg		1.0		SW6010B	04/20/05 19:32 / jjw
Chromium	59.4	mg/kg		5.0		SW6010B	04/20/05 19:32 / jjw
Cobalt	207	mg/kg		5.0		SW6010B	04/20/05 19:32 / jjw
Iron	243000	mg/kg	D	80		SW6010B	04/22/05 03:51 / jjw
Lead	140	mg/kg		5.0		SW6010B	04/20/05 19:32 / jjw
Manganese	11700	mg/kg		5.0		SW6010B	04/22/05 03:51 / jjw
Mercury	ND	mg/kg		1.0		SW7471A	04/25/05 13:57 / KC
Nickel	20.4	mg/kg		5.0		SW6020	04/27/05 00:56 / rth
Phosphorus	584	mg/kg		10		SW6010B	04/22/05 03:51 / jjw
Selenium	8.5	mg/kg		5.0		SW6020	04/27/05 00:56 / rth
Zinc	16900	mg/kg		5.0		SW6010B	04/22/05 03:51 / jjw

Report Definitions: RL - Analyte reporting limit.
 QCL - Quality control limit.
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-003
 Client Sample ID: ASP03-B14

Report Date: 05/02/05
 Collection Date: 04/14/05 14:28
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / B
PHYSICAL CHARACTERISTICS							
Moisture	0.500	wt%		0.0100		SW3550A	04/22/05 08:15 / MC
CHEMICAL CHARACTERISTICS							
pH, 1:2	8.6	s.u.		0.1		ASA10-3	04/25/05 16:18 / srn
Chloride, 1:2	1.99	mg/kg		1.00		ASA10-3	04/26/05 11:49 / qes
METALS, TOTAL							
Antimony	33.7	mg/kg		5.0		SW6020	04/27/05 01:03 / rth
Arsenic	118	mg/kg		5.0		SW6020	04/27/05 01:03 / rth
Beryllium	ND	mg/kg		5.0		SW6010B	04/22/05 04:02 / jjw
Cadmium	2.6	mg/kg		1.0		SW6010B	04/20/05 19:35 / jjw
Chromium	67.1	mg/kg		5.0		SW6010B	04/20/05 19:35 / jjw
Cobalt	117	mg/kg		5.0		SW6010B	04/20/05 19:35 / jjw
Iron	264000	mg/kg	D	80		SW6010B	04/22/05 04:02 / jjw
Lead	63.8	mg/kg		5.0		SW6010B	04/20/05 19:35 / jjw
Manganese	13200	mg/kg		5.0		SW6010B	04/22/05 04:02 / jjw
Mercury	ND	mg/kg		1.0		SW7471A	04/25/05 13:59 / KC
Nickel	14.5	mg/kg		5.0		SW6020	04/27/05 01:03 / rth
Phosphorus	612	mg/kg		10		SW6010B	04/22/05 04:02 / jjw
Selenium	8.4	mg/kg		5.0		SW6020	04/27/05 01:03 / rth
Zinc	13500	mg/kg		5.0		SW6010B	04/22/05 04:02 / jjw
VOLATILE ORGANIC COMPOUNDS							
Bromoform	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Benzene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Bromobenzene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Bromochloromethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Bromodichloromethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Bromomethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Carbon tetrachloride	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Chlorobenzene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Chloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
2-Chloroethyl vinyl ether	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Chloroform	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Chloromethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
2-Chlorotoluene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
4-Chlorotoluene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Chlorodibromomethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,2-Dibromoethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Dibromomethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,2-Dichlorobenzene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.

ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
Project: ASARCO Slag Pile
Lab ID: H05040130-003
Client Sample ID: ASP03-B14

Report Date: 05/02/05
Collection Date: 04/14/05 14:28
Date Received: 04/14/05
Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
VOLATILE ORGANIC COMPOUNDS							
1,3-Dichlorobenzene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,4-Dichlorobenzene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Dichlorodifluoromethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,1-Dichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,2-Dichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
cis-1,2-Dichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,1-Dichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
trans-1,2-Dichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,2-Dichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,3-Dichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
2,2-Dichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,1-Dichloropropene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
cis-1,3-Dichloropropene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
trans-1,3-Dichloropropene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Ethylbenzene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Methyl tert-butyl ether (MTBE)	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Methylene chloride	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Methyl ethyl ketone	ND	mg/kg		4.0		SW8260B	04/21/05 16:42 / trr
Styrene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,1,1,2-Tetrachloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,1,2,2-Tetrachloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Tetrachloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Toluene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,1,1-Trichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,1,2-Trichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Trichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Trichlorofluoromethane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
1,2,3-Trichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Vinyl chloride	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
m+p-Xylenes	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
o-Xylene	ND	mg/kg		0.20		SW8260B	04/21/05 16:42 / trr
Surr: p-Bromofluorobenzene	134	%REC			76-160	SW8260B	04/21/05 16:42 / trr
Surr: Dibromofluoromethane	116	%REC			70-132	SW8260B	04/21/05 16:42 / trr
Surr: 1,2-Dichloroethane-d4	114	%REC			60-135	SW8260B	04/21/05 16:42 / trr
Surr: Toluene-d8	120	%REC			75-136	SW8260B	04/21/05 16:42 / trr
SEMI-VOLATILE ORGANIC COMPOUNDS							
Acenaphthene	ND	mg/kg		0.33		SW8270C	04/21/05 13:55 / sm
Acenaphthylene	ND	mg/kg		0.33		SW8270C	04/21/05 13:55 / sm
Anthracene	ND	mg/kg		0.33		SW8270C	04/21/05 13:55 / sm
Benzo(a)anthracene	ND	mg/kg		0.23		SW8270C	04/21/05 13:55 / sm

Report: RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-003
 Client Sample ID: ASP03-B14

Report Date: 05/02/05
 Collection Date: 04/14/05 14:28
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	RL	QCL	Method	Analysis Date / Time
SEMI-VOLATILE ORGANIC COMPOUNDS							
Benzo(a)pyrene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Benzo(b)fluoranthene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Benzo(g,h,i)perylene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Benzo(k)fluoranthene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Chrysene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Dibenzo(a,h)anthracene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Fluoranthene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Fluorene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Indeno(1,2,3-cd)pyrene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Naphthalene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Phenanthrene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Pyrene	ND	mg/kg		0.33		SW8270C	04/21/05 13:56 / sm
Surr: 2-Fluorobiphenyl	82.5	%REC			30-115	SW8270C	04/21/05 13:56 / sm
Surr: Nitrobenzene-d5	83.7	%REC			23-120	SW8270C	04/21/05 13:56 / sm
Surr: Terphenyl-d14	98.6	%REC			18-137	SW8270C	04/21/05 13:56 / sm
POLYCHLORINATED BIPHENYLS (PCB'S)							
Aroclor 1016	ND	mg/kg		0.017		SW8082	04/24/05 03:13 / law
Aroclor 1221	ND	mg/kg		0.017		SW8082	04/24/05 03:13 / law
Aroclor 1232	ND	mg/kg		0.017		SW8082	04/24/05 03:13 / law
Aroclor 1242	ND	mg/kg		0.017		SW8082	04/24/05 03:13 / law
Aroclor 1248	ND	mg/kg		0.017		SW8082	04/24/05 03:13 / law
Aroclor 1254	ND	mg/kg		0.017		SW8082	04/24/05 03:13 / law
Aroclor 1260	ND	mg/kg		0.017		SW8082	04/24/05 03:13 / law
Aroclor 1262	ND	mg/kg		0.017		SW8082	04/24/05 03:13 / law
Aroclor 1268	ND	mg/kg		0.017		SW8082	04/24/05 03:13 / law
Surr: Decachlorobiphenyl	96.0	%REC			50-126	SW8082	04/24/05 03:13 / law
Surr: Tetrachloro-m-xylene	86.0	%REC			42-115	SW8082	04/24/05 03:13 / law

Sample extract received a Sulfuric Acid Clean-up (EPA Method 3665) and a Sulfur Clean-up (EPA Method 3650) prior to analysis

Report RL - Analyte reporting limit.
 Definitions: OCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-004
 Client Sample ID: ASP04-C4

Report Date: 05/02/05
 Collection Date: 04/14/05 14:37
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
METALS, TOTAL							
Antimony	43.5	mg/kg		5.0		SW6020	04/27/05 01:10 / rth
Arsenic	155	mg/kg		5.0		SW6020	04/27/05 01:10 / rth
Beryllium	ND	mg/kg		5.0		SW6010B	04/22/05 04:06 / jjw
Cadmium	5.1	mg/kg		1.0		SW6010B	04/20/05 19:39 / jjw
Chromium	71.2	mg/kg		5.0		SW6010B	04/20/05 19:39 / jjw
Cobalt	212	mg/kg		5.0		SW6010B	04/20/05 19:39 / jjw
Iron	273000	mg/kg	D	80		SW6010B	04/22/05 04:06 / jjw
Lead	364	mg/kg		5.0		SW6010B	04/20/05 19:39 / jjw
Manganese	12200	mg/kg		5.0		SW6010B	04/22/05 04:06 / jjw
Mercury	ND	mg/kg		1.0		SW7471A	04/25/05 14:01 / KC
Nickel	22.9	mg/kg		5.0		SW6020	04/27/05 01:10 / rth
Phosphorus	586	mg/kg		10		SW6010B	04/22/05 04:06 / jjw
Selenium	12.1	mg/kg		5.0		SW6020	04/27/05 01:10 / rth
Zinc	17900	mg/kg		5.0		SW6010B	04/22/05 04:06 / jjw

Report RL - Analyte reporting limit.
 Definitions: QCL - Quality control limit.
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-005
 Client Sample ID: ASP05-C9

Report Date: 05/02/05
 Collection Date: 04/14/05 14:44
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
PHYSICAL CHARACTERISTICS							
Moisture	0.800	wt%		0.0100		SW3550A	04/22/05 08:15 / MC
CHEMICAL CHARACTERISTICS							
pH, 1:2	9.0	s.u.		0.1		ASA10-3	04/25/05 16:18 / srm
Chloride, 1:2	2.89	mg/kg		1.00		ASA10-3	04/26/05 12:13 / qed
METALS, TOTAL							
Antimony	37.1	mg/kg		5.0		SW6020	04/27/05 01:44 / rth
Arsenic	117	mg/kg		5.0		SW6020	04/27/05 01:44 / rth
Beryllium	ND	mg/kg		5.0		SW6010B	04/22/05 04:13 / jjw
Cadmium	3.1	mg/kg		1.0		SW6010B	04/20/05 19:42 / jjw
Chromium	74.4	mg/kg		5.0		SW6010B	04/20/05 19:42 / jjw
Cobalt	153	mg/kg		5.0		SW6010B	04/20/05 19:42 / jjw
Iron	252000	mg/kg	D	80		SW5010B	04/22/05 04:13 / jjw
Lead	160	mg/kg		5.0		SW6010B	04/20/05 19:42 / jjw
Manganese	11800	mg/kg		5.0		SW6010B	04/22/05 04:13 / jjw
Mercury	ND	mg/kg		1.0		SW7471A	04/25/05 14:04 / KC
Nickel	15.9	mg/kg		5.0		SW6020	04/27/05 01:44 / rth
Phosphorus	707	mg/kg		10		SW6010B	04/22/05 04:13 / jjw
Selenium	12.7	mg/kg		5.0		SW6020	04/27/05 01:44 / rth
Zinc	18500	mg/kg		5.0		SW6010B	04/22/05 04:13 / jjw
VOLATILE ORGANIC COMPOUNDS							
Bromoform	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Benzene	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Bromobenzene	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Bromochloromethane	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Bromodichloromethane	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Bromomethane	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Carbon tetrachloride	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Chlorobenzene	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Chloroethane	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
2-Chloroethyl vinyl ether	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Chloroform	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Chloromethane	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
2-Chlorotoluene	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
4-Chlorotoluene	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Chlorodibromomethane	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
1,2-Dibromoethane	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
Dibromomethane	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr
1,2-Dichlorobenzene	ND	mg/kg		0.20		SW8250B	04/21/05 17:16 / trr

Report RL - Analyte reporting limit.

Definitions: QCL - Quality control limit.

D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level

ND - Not detected at the reporting limit

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-005
 Client Sample ID: ASP05-C9

Report Date: 05/02/05
 Collection Date: 04/14/05 14:44
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
VOLATILE ORGANIC COMPOUNDS							
1,3-Dichlorobenzene	ND	mg/kg		0.20		SWS260B	04/21/05 17:16 / trr
1,4-Dichlorobenzene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Dichlorodifluoromethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
1,1-Dichloroethane	ND	mg/kg		0.20		SWS260B	04/21/05 17:16 / trr
1,2-Dichloroethane	ND	mg/kg		0.20		SWS260B	04/21/05 17:16 / trr
cis-1,2-Dichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
1,1-Dichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
trans-1,2-Dichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
1,2-Dichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
1,3-Dichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
2,2-Dichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
1,1-Dichloropropene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
cis-1,3-Dichloropropene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
trans-1,3-Dichloropropene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Ethylbenzene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Methyl tert-butyl ether (MTBE)	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Methylene chloride	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Methyl ethyl ketone	ND	mg/kg		4.0		SW8260B	04/21/05 17:16 / trr
Styrene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
1,1,1,2-Tetrachloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:15 / trr
1,1,2,2-Tetrachloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Tetrachloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Toluene	ND	mg/kg		0.20		SW8260B	04/21/05 17:15 / trr
1,1,1-Trichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:15 / trr
1,1,2-Trichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Trichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:15 / trr
Trichlorofluoromethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
1,2,3-Trichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Vinyl chloride	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
m+p-Xylenes	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
o-Xylene	ND	mg/kg		0.20		SW8260B	04/21/05 17:16 / trr
Surr: p-Bromofluorobenzene	118	%REC			78-160	SW8260B	04/21/05 17:16 / trr
Surr: Dibromofluoromethane	104	%REC			70-132	SW8260B	04/21/05 17:16 / trr
Surr: 1,2-Dichloroethane-d4	104	%REC			60-136	SW8260B	04/21/05 17:15 / trr
Surr: Toluene-d8	104	%REC			75-138	SW8260B	04/21/05 17:16 / trr
SEMI-VOLATILE ORGANIC COMPOUNDS							
Acenaphthene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm
Acenaphthylene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm
Anthracene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm
Benzo(a)anthracene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm

Report RL - Analyte reporting limit.
 Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level
 ND - Not detected at the reporting limit.

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-005
 Client Sample ID: ASP05-C9

Report Date: 05/02/05
 Collection Date: 04/14/05 14:44
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
SEMI-VOLATILE ORGANIC COMPOUNDS							
Benzo(a)pyrene	ND	mg/kg		0.33		SWS270C	04/21/05 14:39 / sm
Benzo(b)fluoranthene	ND	mg/kg		0.33		SW6270C	04/21/05 14:39 / sm
Benzo(g,h,i)perylene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm
Benzo(k)fluoranthene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm
Chrysene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm
Dibenzo(a,h)anthracene	ND	mg/kg		0.33		SW6270C	04/21/05 14:39 / sm
Fluoranthene	ND	mg/kg		0.33		SW6270C	04/21/05 14:39 / sm
Fluorene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm
Indeno(1,2,3-cd)pyrene	ND	mg/kg		0.33		SW6270C	04/21/05 14:39 / sm
Naphthalene	ND	mg/kg		0.33		SW6270C	04/21/05 14:39 / sm
Phenanthrene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm
Pyrene	ND	mg/kg		0.33		SW8270C	04/21/05 14:39 / sm
Surr: 2-Fluorobiphenyl	88.6	%REC			30-115	SWS270C	04/21/05 14:39 / sm
Surr: Nitrobenzene-d5	86.9	%REC			23-120	SWS270C	04/21/05 14:39 / sm
Surr: Terphenyl-d14	98.9	%REC			16-137	SW8270C	04/21/05 14:39 / sm

POLYCHLORINATED BIPHENYLS (PCB'S)

Aroclor 1016	ND	mg/kg		0.017		SW8082	04/24/05 03:40 / law
Aroclor 1221	ND	mg/kg		0.017		SW8082	04/24/05 03:40 / law
Aroclor 1232	ND	mg/kg		0.017		SW8082	04/24/05 03:40 / law
Aroclor 1242	ND	mg/kg		0.017		SW8082	04/24/05 03:40 / law
Aroclor 1248	ND	mg/kg		0.017		SW8082	04/24/05 03:40 / law
Aroclor 1254	ND	mg/kg		0.017		SW8082	04/24/05 03:40 / law
Aroclor 1250	ND	mg/kg		0.017		SW8082	04/24/05 03:40 / law
Aroclor 1262	ND	mg/kg		0.017		SW8082	04/24/05 03:40 / law
Aroclor 1268	ND	mg/kg		0.017		SW8082	04/24/05 03:40 / law
Surr: Decachlorobiphenyl	140	%REC	S		50-126	SW8082	04/24/05 03:40 / law
Surr: Tetrachloro-m-xylene	108	%REC			42-115	SW8082	04/24/05 03:40 / law

Sample extract received a Sulfuric Acid Clean-up (EPA Method 3555) and a Sulfur Clean-up (EPA Method 3660) prior to analysis.

Report
 Definitions: RL - Analyte reporting limit.
 QCL - Quality control limit.
 S - Spike recovery outside of advisory limits.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-006
 Client Sample ID: ASP06-D16

Report Date: 05/02/05
 Collection Date: 04/14/05 14:50
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
METALS, TOTAL							
Antimony	42.5	mg/kg		5.0		SW6020	04/27/05 01:51 / rth
Arsenic	130	mg/kg		5.0		SW6020	04/27/05 01:51 / rth
Beryllium	ND	mg/kg		5.0		SW5010B	04/22/05 04:17 / jjw
Cadmium	2.2	mg/kg		1.0		SW6010B	04/20/05 19:46 / jjw
Chromium	68.4	mg/kg		5.0		SW6010B	04/20/05 19:46 / jjw
Cobalt	173	mg/kg		5.0		SW6010B	04/20/05 19:46 / jjw
Iron	305000	mg/kg	D	80		SW6010B	04/22/05 04:17 / jjw
Lead	55.5	mg/kg		5.0		SW6010B	04/20/05 19:46 / jjw
Manganese	11800	mg/kg		5.0		SW6010B	04/22/05 04:17 / jjw
Mercury	ND	mg/kg		1.0		SW7471A	04/25/05 14:06 / KC
Nickel	18.8	mg/kg		5.0		SW6020	04/27/05 01:51 / rth
Phosphorus	647	mg/kg		10		SW6010B	04/22/05 04:17 / jjw
Selenium	11.0	mg/kg		5.0		SW6020	04/27/05 01:51 / rth
Zinc	19100	mg/kg		5.0		SW5010B	04/22/05 04:17 / jjw

Report RL - Analyte reporting limit.
 Definitions: QCL - Quality control limit.
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-007
 Client Sample ID: ASP07-F3

Report Date: 05/02/05
 Collection Date: 04/14/05 14:57
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
METALS, TOTAL							
Antimony	42.7	mg/kg		5.0		SW6020	04/27/05 01:58 / rth
Arsenic	102	mg/kg		5.0		SW6020	04/27/05 01:58 / rth
Beryllium	ND	mg/kg		5.0		SW6010B	04/22/05 04:20 / jjw
Cadmium	1.9	mg/kg		1.0		SW6010B	04/20/05 19:49 / jjw
Chromium	70.5	mg/kg		5.0		SW6010B	04/20/05 19:49 / jjw
Cobalt	171	mg/kg		5.0		SW6010B	04/20/05 19:49 / jjw
Iron	286000	mg/kg	D	80		SW6010B	04/22/05 04:20 / jjw
Lead	45.3	mg/kg		5.0		SW6010B	04/20/05 19:49 / jjw
Manganese	12100	mg/kg		5.0		SW6010B	04/22/05 04:20 / jjw
Mercury	ND	mg/kg		1.0		SW7471A	04/25/05 14:10 / KC
Nickel	17.4	mg/kg		5.0		SW6020	04/27/05 01:58 / rth
Phosphorus	578	mg/kg		10		SW6010B	04/22/05 04:20 / jjw
Selenium	13.8	mg/kg		5.0		SW6020	04/27/05 01:58 / rth
Zinc	19100	mg/kg		5.0		SW6010B	04/22/05 04:20 / jjw

Report Definitions: RL - Analyte reporting limit.
 QCL - Quality control limit.
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
Project: ASARCO Slag Pile
Lab ID: H05040130-008
Client Sample ID: ASP08-G2

Report Date: 05/02/05
Collection Date: 04/14/05 15:04
Date Received: 04/14/05
Matrix: Solid

Analyses	Result	Units	Qual	MCL/ RL QCL	Method	Analysis Date / By
PHYSICAL CHARACTERISTICS						
Moisture	0.800	wt%		0.0100	SW3550A	04/22/05 08:15 / MC
CHEMICAL CHARACTERISTICS						
pH, 1:2	9.2	s.u.		0.1	ASA10-3	04/25/05 16:18 / srm
Chloride, 1:2	1.06	mg/kg		1.00	ASA10-3	04/26/05 12:48 / qed
METALS, TOTAL						
Antimony	43.8	mg/kg		5.0	SW6020	04/27/05 02:05 / rth
Arsenic	119	mg/kg		5.0	SW6020	04/27/05 02:05 / rth
Beryllium	ND	mg/kg		5.0	SW6010B	04/22/05 04:24 / jjw
Cadmium	2.5	mg/kg		1.0	SW6010B	04/20/05 20:00 / jjw
Chromium	59.8	mg/kg		5.0	SW6010B	04/20/05 20:00 / jjw
Cobalt	194	mg/kg		5.0	SW6010B	04/20/05 20:00 / jjw
Iron	290000	mg/kg	D	60	SW6010B	04/22/05 04:24 / jjw
Lead	116	mg/kg		5.0	SW6010B	04/20/05 20:00 / jjw
Manganese	13100	mg/kg		5.0	SW6010B	04/22/05 04:24 / jjw
Mercury	ND	mg/kg		1.0	SW7471A	04/25/05 14:12 / KC
Nickel	17.9	mg/kg		5.0	SW6020	04/27/05 02:05 / rth
Phosphorus	720	mg/kg		10	SW6010B	04/22/05 04:24 / jjw
Selenium	9.9	mg/kg		5.0	SW6020	04/27/05 02:05 / rth
Zinc	21100	mg/kg		5.0	SW6010B	04/22/05 04:24 / jjw
VOLATILE ORGANIC COMPOUNDS						
Bromoform	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Benzene	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Bromobenzene	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Bromochloromethane	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Bromodichloromethane	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Bromomethane	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Carbon tetrachloride	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Chlorobenzene	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Chloroethane	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
2-Chloroethyl vinyl ether	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Chloroform	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Chloromethane	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
2-Chlorotoluene	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
4-Chlorotoluene	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Chlorodibromomethane	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
1,2-Dibromoethane	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
Dibromomethane	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr
1,2-Dichlorobenzene	ND	mg/kg		0.20	SW8260B	04/21/05 17:51 / trr

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.
D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-008
 Client Sample ID: ASP08-G2

Report Date: 05/02/05
 Collection Date: 04/14/05 15:04
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
VOLATILE ORGANIC COMPOUNDS							
1,3-Dichlorobenzene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,4-Dichlorobenzene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Dichlorodifluoromethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,1-Dichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,2-Dichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
cis-1,2-Dichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,1-Dichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
trans-1,2-Dichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,2-Dichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,3-Dichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
2,2-Dichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,1-Dichloropropene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
cis-1,3-Dichloropropene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
trans-1,3-Dichloropropene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Ethylbenzene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Methyl tert-butyl ether (MTBE)	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Methylene chloride	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Methyl ethyl ketone	ND	mg/kg		4.0		SW8260B	04/21/05 17:51 / trr
Styrene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,1,1,2-Tetrachloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,1,2,2-Tetrachloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Tetrachloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Toluene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,1,1-Trichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,1,2-Trichloroethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Trichloroethene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Trichlorofluoromethane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
1,2,3-Trichloropropane	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Vinyl chloride	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
m+p-Xylenes	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
o-Xylene	ND	mg/kg		0.20		SW8260B	04/21/05 17:51 / trr
Surr: p-Bromofluorobenzene	116	%REC			78-160	SW8260B	04/21/05 17:51 / trr
Surr: Dibromofluoromethane	103	%REC			70-132	SW8260B	04/21/05 17:51 / trr
Surr: 1,2-Dichloroethane-d4	102	%REC			60-135	SW8260B	04/21/05 17:51 / trr
Surr: Toluene-d8	102	%REC			75-138	SW8260B	04/21/05 17:51 / trr
SEMI-VOLATILE ORGANIC COMPOUNDS							
Acenaphthene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Acenaphthylene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Anthracene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Benzo(a)anthracene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm

Report RL - Analyte reporting limit.
 Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
Project: ASARCO Slag Pile
Lab ID: H05040130-008
Client Sample ID: ASP08-G2

Report Date: 05/02/05
Collection Date: 04/14/05 15:04
Date Received: 04/14/05
Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
SEMI-VOLATILE ORGANIC COMPOUNDS							
Benzo(a)pyrene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Benzo(b)fluoranthene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Benzo(g,h,i)perylene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Benzo(k)fluoranthene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Chrysene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Dibenzo(a,h)anthracene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Fluoranthene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Fluorene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Indeno(1,2,3-cd)pyrene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Naphthalene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Phenanthrene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Pyrene	ND	mg/kg		0.33		SW8270C	04/21/05 15:21 / sm
Surr: 2-Fluorobiphenyl	75.9	%REC			30-115	SW8270C	04/21/05 15:21 / sm
Surr: Nitrobenzene-d5	76.0	%REC			23-120	SW8270C	04/21/05 15:21 / sm
Surr: Terphenyl-d14	88.9	%REC			18-137	SW8270C	04/21/05 15:21 / sm
POLYCHLORINATED BIPHENYLS (PCB'S)							
Aroclor 1016	ND	mg/kg		0.017		SW8082	04/24/05 04:08 / law
Aroclor 1221	ND	mg/kg		0.017		SW8082	04/24/05 04:08 / law
Aroclor 1232	ND	mg/kg		0.017		SW8082	04/24/05 04:08 / law
Aroclor 1242	ND	mg/kg		0.017		SW8082	04/24/05 04:08 / law
Aroclor 1248	ND	mg/kg		0.017		SW8082	04/24/05 04:08 / law
Aroclor 1254	ND	mg/kg		0.017		SW8082	04/24/05 04:08 / law
Aroclor 1260	ND	mg/kg		0.017		SW8082	04/24/05 04:08 / law
Aroclor 1262	ND	mg/kg		0.017		SW8082	04/24/05 04:08 / law
Aroclor 1268	ND	mg/kg		0.017		SW8082	04/24/05 04:08 / law
Surr: Decachlorobiphenyl	125	%REC			50-126	SW8082	04/24/05 04:08 / law
Surr: Tetrachloro-m-xylene	90.0	%REC			42-115	SW8082	04/24/05 04:08 / law
Sample extract received a Sulfuric Acid Clean-up (EPA Method 3655) and a Sulfur Clean-up (EPA Method 3650) prior to analysis.							

Sample extract received a Sulfuric Acid Clean-up (EPA Method 3655) and a Sulfur Clean-up (EPA Method 3650) prior to analysis.

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

Client: MT DEQ
Project: ASARCO Slag Pile
Lab ID: H05040130-009
Client Sample ID: ASP09-G4

Report Date: 05/02/05
Collection Date: 04/14/05 15:07
Date Received: 04/14/05
Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
METALS, TOTAL							
Antimony	57.6	mg/kg		5.0		SW6020	04/27/05 02:12 / rlh
Arsenic	109	mg/kg		5.0		SW6020	04/27/05 02:12 / rlh
Beryllium	ND	mg/kg		5.0		SW6010B	04/22/05 04:27 / jjw
Cadmium	1.4	mg/kg		1.0		SW6010B	04/20/05 20:04 / jjw
Chromium	90.0	mg/kg		5.0		SW6010B	04/20/05 20:04 / jjw
Cobalt	204	mg/kg		5.0		SW6010B	04/20/05 20:04 / jjw
Iron	294000	mg/kg	D	80		SW6010B	04/22/05 04:27 / jjw
Lead	64.0	mg/kg		5.0		SW6010B	04/20/05 20:04 / jjw
Manganese	11900	mg/kg		5.0		SW6010B	04/22/05 04:27 / jjw
Mercury	ND	mg/kg		1.0		SW7471A	04/25/05 14:14 / KC
Nickel	20.6	mg/kg		5.0		SW6020	04/27/05 02:12 / rlh
Phosphorus	562	mg/kg		10		SW6010B	04/22/05 04:27 / jjw
Selenium	12.2	mg/kg		5.0		SW6020	04/27/05 02:12 / rlh
Zinc	20100	mg/kg		5.0		SW6010B	04/22/05 04:27 / jjw

Report Definitions: RL - Analyte reporting limit.
OCL - Quality control limit.
D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Client: MT DEQ
 Project: ASARCO Slag Pile
 Lab ID: H05040130-010
 Client Sample ID: ASP10-H16

Report Date: 05/02/05
 Collection Date: 04/14/05 15:15
 Date Received: 04/14/05
 Matrix: Solid

Analyses	Result	Units	Qual	MCL/		Method	Analysis Date / By
				RL	QCL		
METALS, TOTAL							
Antimony	34.1	mg/kg		5.0		SW6020	04/22/05 05:23 / rh
Arsenic	117	mg/kg		5.0		SW6020	04/22/05 05:23 / rh
Beryllium	ND	mg/kg		5.0		SW6010B	04/22/05 04:31 / jjw
Cadmium	2.1	mg/kg		1.0		SW6010B	04/20/05 20:07 / jjw
Chromium	59.0	mg/kg		5.0		SW6010B	04/20/05 20:07 / jjw
Cobalt	137	mg/kg		5.0		SW6010B	04/20/05 20:07 / jjw
Iron	305000	mg/kg	D	80		SW6010B	04/22/05 04:31 / jjw
Lead	103	mg/kg		5.0		SW6010B	04/20/05 20:07 / jjw
Manganese	10400	mg/kg		5.0		SW6010B	04/22/05 04:31 / jjw
Mercury	ND	mg/kg		1.0		SW7471A	04/25/05 14:16 / KC
Nickel	14.7	mg/kg		5.0		SW6020	04/22/05 05:23 / rh
Phosphorus	710	mg/kg		10		SW6010B	04/22/05 04:31 / jjw
Selenium	9.1	mg/kg		5.0		SW6020	04/22/05 05:23 / rh
Zinc	22200	mg/kg		5.0		SW6010B	04/22/05 04:31 / jjw

Report RL - Analyte reporting limit.
 Definitions: QCL - Quality control limit.
 D - RL increased due to sample matrix interference.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.

APPENDIX 4-1-2

SUMMARY OF SLAG TESTING ANALYSES INCLUDING TEST BASIN WATER QUALITY, SLAG BOTTLE ROLL TESTS AND EP TOXICITY TESTS

OF 2000 WATER QUALITY ANALYSES - ASARCO EAST HELENA

SITE NAME	FUMED SLAG	FUMED SLAG	FUMED SLAG	FUMED SLAG	FUMED SLAG	FUMED SLAG	FUMED SLAG	FUMED SLAG	FUMED SLAG	FUMED SLAG
SAMPLE DATE	12/30/86	04/02/87	04/22/87	04/22/87	05/22/87	05/22/87	05/22/87	05/22/87	07/15/87	07/15/87
LAP	ASARCO	ASARCO	ASARCO	CHMTC	ASARCO	ASARCO	CHMTC	CHMTC	ASARCO	ASARCO
REMARKS	BOTTLE			SPLIT	REPLICATE		SPLIT	REPLICATE	REPLICATE	
SAMPLE NUMBER	ROLL TEST	8704-1	8704-20		8705-50	8705-47			8707-02	8707-01
PHYSICAL PARAMETERS										
WATER TEMPERATURE (C)			7.5			9.7				
SPEC. COND. (UMHOS/CM) FIELD			2235		2268	2265			2137	2150
SPEC. COND. (UMHOS/CM) LAB	115	1950	2250			2320				2400
PH FIELD			6.16		7.48	7.69				7.46
PH LAB	9.9	7.77	6.81			7.52				7.55
TDS MEAS. @ 180 DEG. C	94	1842	1903	993		2086	2227			1912
OXYGEN (O) DISS			4.3			4.3				4.1
DEPTH TO SWL BELOW MP (FT)			8.74			8.01				
COMMON IONS										
CALCIUM (CA)	12	510	454	449.0		422	417.0	412.0		321
MAGNESIUM (MG)	0.49	20	25.5	27.40		20.2	25.10	24.90		22.9
SODIUM (NA)	5.1	76	71.5	76.6		85	72.5	71.8		74
POTASSIUM (K)	3.9	54	65	60.80		74	136.00	122.00		68
BICARBONATE (HCO3) (LAB)	11.0	260	102			98				84
CARBONATE AS CO3 (LAB)	19	11	11			11				11.0
SULFATE (SO4)	10	1450	1425	1240.0		1338	1304.0			1200
CHLORIDE (CL)	18	6.0	7.0	10.0		7.0	30.0			4.0
TRACE ELEMENTS										
ARSENIC (AS) DISS	0.19	0.0325	0.0283	0.0198	0.038	0.030	0.0530	0.0320	0.057	0.039
ARSENIC (AS) +3			0.014						0.0216	0.040
ARSENIC (AS) +5			0.010						0.0722	0.0268
CADMIUM (CD) DISS	0.003	0.075	0.040	0.0720	0.051	0.051	0.0520	0.0500	0.055	0.049
COFFER (CU) DISS	0.008	0.280	0.193	0.2260	0.125	0.128	0.1480	0.1340	0.118	0.110
IRON (FE) DISS	0.11	0.020	0.020	0.100	0.044	0.045	0.100	0.100	0.020	0.020
IRON (FE II)			0.010						0.060	0.080
LEAD (PB) DISS	0.017	0.045	0.030	0.0334	0.019	0.020	0.0323	0.0432	0.016	0.021
MANGANESE (MN) DISS	0.017	1.080	1.440	2.640	1.910	1.930	2.660	2.640	2.930	2.890
ZINC (ZN) DISS	0.023	3.580	3.700	4.450	2.830	2.890	2.860	2.820	2.500	2.300

All quantities in milligrams per liter unless otherwise noted. Blank line indicates parameter not tested.

Output Date: 03-19-1989
HWQ-6/86-R1

SLAG WATER QUALITY ANALYSES - ASARCO EAST HELENA

SITE NAME	FUMED SLAG	FUMED SLAG	UNFUMED SLAG	UNFUMED SLAG	UNFUMED SLAG	UNFUMED SLAG	UNFUMED SLAG	UNFUMED SLAG	UNFUMED SLAG
SAMPLE DATE	02/22/87	02/22/87	12/30/86	04/22/87	04/22/87	05/22/87	05/22/87	07/15/87	09/22/87
LAB	ASARCO	ASARCO	ASARCO	ASARCO	CHMTC	CHMTC	ASARCO	ASARCO	ASARCO
REMARKS	REPLICATE		BOTTLE		SPLIT	SPLIT			
REMARKS			ROLL TEST						
SAMPLE NUMBER	8709-06	8709-04		8704-24			8705-48	8707-03	8709-07
PHYSICAL PARAMETERS									
WATER TEMPERATURE (C)		16		10.5			10.9		17
SPEC. COND. (UMHOS/CM) FIELD	1368	1366		16296			19978	19850	
SPEC. COND. (UMHOS/CM) LAB		1350	200	16500			20200	22000	12200
PH FIELD				9.49			9.97	9.48	
PH LAB		7.63	10.4	9.25			9.6	9.73	9.69
TDS MEAS. @ 180 DEG. C		1114	206	14183	7298	18720	18523	18172	10984
OXYGEN (O) DISS		4.0		4.5			3.2	3.0	4.1
DEPTH TO SUL BELOW MP (FT)		7.74		8.83			7.85		7.02
COMMON IONS									
CALCIUM (CA)		126.5	17	371	437.0		361	426	345
MAGNESIUM (MG)		11	0.22	8.5	8.76		6.7	6.4	4.2
SODIUM (NA)		45	19	2900	2960.0		3890	3800	2200
POTASSIUM (K)		65	22	1950	158.00		2650	2550	1540
ALKALINITY AS CaCO3 (LAB)							587		
BICARBONATE (HCO3) (LAB)		72	11.0	486			11	11.0	11.0
CARBONATE AS CO3 (LAB)		11.0	36	11			284	163	197
HYDROXIDE (OH)							38	46	30
SULFATE (SO4)		480	16	9200	2480.0	2463.0	1200	11750	6750
CHLORIDE (CL)		3.0	16	57	63.0	75.0	66	74	35
TRACE ELEMENTS									
ARSENIC (AS) DISS	0.075	0.054	0.31	0.620	0.5130		0.353	0.590	0.553
ARSENIC (AS) +3				0.400				0.550	
ARSENIC (AS) +5				0.030				0.054	
CADMIUM (CD) DISS	0.021	0.021	0.003	0.030	0.0063		0.003	0.005	0.003
COFFER (CU) DISS	0.055	0.056	0.008	0.130	0.1190		0.128	0.085	0.043
IRON (FE) DISS	0.020	0.020	0.070	0.150	0.190		0.225	0.020	0.020
IRON (FE II)	0.02	0.01		0.010				0.070	0.01
LEAD (PB) DISS	0.023	0.026	0.083	0.098	0.1430		0.0505	0.021	0.094
MANGANESE (MN) DISS	1.590	1.540	0.017	0.155	0.139		0.083	0.090	0.050
ZINC (ZN) DISS	0.813	0.788	0.053	0.100	0.090		0.048	0.030	0.023

All quantities in milligrams per liter unless otherwise noted. Blank line indicates parameter not tested.

Output Date: 03-19-1989
HWD-6/BA-F1

TABLE 1
East Helena

SLAG SAMPLE LEACHATE ANALYSIS

1979

979

SARCO

ab No.

ab No.	Description	(PPM in Leachate)								
		As	Ba	Cd	Cr	Pb	Hg	Se	Ag	(Zn)
3278	Slag 1 (2)	.018	.3	.08	<.01	.6	<.001	<.005	<.01	3.5
3279	Slag 2 (2)	<.014	.1	.13	<.01	<.1	<.001	<.005	<.01	2.6
3280	Slag 3 (2)	.020	.1	.03	<.01	3.4	<.001	<.005	<.01	2.1
3281	Slag 4 (2)	<.014	.2	<.01	<.01	<.1	<.001	<.005	<.01	1.0
3282	Slag 5 (7)	.032	.2	<.01	<.01	3.3	<.001	<.005	<.01	5.0
3283	Slag 6 (7)	<.014	.1	.15	<.01	1.0	<.001	<.005	<.01	6.0

Maximum Contaminant
Levels for Non-
toxic Leachates

0.5

10.0

0.1

0.5

0.5

.02

0.1

0.5

*

NOTE



Currently unspecified but estimated to be 50 ppm (10 times the Drinking Water Standard).

K

ASARCO Incorporated
Department of Environmental Sciences
EAST HELENA
Miscellaneous Sample Results

ASARCO LAB #	SAMPLE DESCRIPTION	1985 SAMPLE DATE	As ppm	Cd ppm	Pb ppm
3658 Air Cooled	Blast Furnace Slag	5/ 7	.12	.002	5.3
3659 Granulated	Blast Furnace Slag	5/ 7	.047	<.002	.050

ASARCO Inc. Incorporated
Department of Environmental Sciences
EAST HELENA
Miscellaneous Sample Results

ASARCO LAB #	SAMPLE DESCRIPTION	1985 SAMPLE DATE	Ag ppm	As ppm	Ba ppm	Cd ppm	Cl ppm
7860	TCLP-Fumed Blast Furnace Slag	10/21	<.002	.45	4.6	.007	.
7861	TCLP-Unfumed Blast Furnace Slag	10/21	<.002	1.2	1.6	.25	.

ASARCO LAB #	SAMPLE DESCRIPTION	1985 SAMPLE DATE	Hg ppb	Pb ppm	Se ppm
7860	TCLP-Fumed Blast Furnace Slag	10/21	<.005	.28	.004
7861	TCLP-Unfumed Blast Furnace Slag	10/21	<.001	10.	.010

ASARCO Incorporated
Department of Environmental Sciences
EAST HELENA
Miscellaneous Sample Results

ASARCO LAB #	SAMPLE DESCRIPTION	1985 SAMPLE DATE	Ag ppm	As ppm	Ba ppm	Cd ppm	F
6378	Air Cooled Slag	8/15	<.005	.012	<1.0	.002	
6379	Granulated Slag	8/15	<.005	.010	<1.0	<.002	

ASARCO LAB #	SAMPLE DESCRIPTION	1985 SAMPLE DATE	Hg ppb	Pb ppm	Se ppm	pH
6378	Air Cooled Slag	8/15	<.50	1.1	<.080	9.2
6379	Granulated Slag	8/15	<.50	.050	<.080	8.0

ASARCO Incorporated
Department of Environmental Sciences
EAST HELENA
Miscellaneous Sample Results

ASARCO LAB #	SAMPLE DESCRIPTION	1983 SAMPLE DATE	Pb ppm	Cd ppm	Cr ppm	Ag ppm	Ba ppm
11370	2-4 mo. old Slag Composite	11/28	9.8	3.9	<.030	<.008	7.2
11371	1 week old Slag Composite	11/28	3.9	<.004	<.030	<.008	8.7

ASARCO LAB #	SAMPLE DESCRIPTION	1983 SAMPLE DATE	As ppm	Se ppm	Hg ppb	pH
11370	2-4 mo. old Slag Composite	11/28	.20	.012	<.50	10.
11371	1 week old Slag Composite	11/28	.35	<.004	<.50	10.

ppm							
Ba	Pb	Cd	Cr	Ag	Se	Hg	As

Maximum allowable levels of contaminants
in the leachate of a non-toxic material.....

100.	5.0	1.0	5.0	5.0	1.0	.2	5.0
------	-----	-----	-----	-----	-----	----	-----

storage area. The sediments are being stored in a protected environment to prevent contamination of the adjacent area from dispersion of the sediments by wind and water. The sediments are located on a concrete pad to prevent contact with adjacent soils. A containment berm around the perimeter of the sediment pile diverts run-on. A geomembrane cover over the sediments prevents wind and water dispersion and eliminates subsequent generation of leachate.

Approximately 31,000 cubic yards of dewatered sediments were transported to the Lower Ore Storage Area. Four thousand cubic yards of these sediments were smelted prior to the stockpile being covered with a geomembrane liner in October 1997. The sediments will remain in this interim storage facility while EPA considers Asarco's request to modify the sediment smelting requirement of the ROD, and instead dispose of these materials in the on-site CAMU.

4.1.4 Slag

The effect of the slag pile on groundwater and surface water was evaluated as part of the 1990 Comprehensive RI/FS. The evaluation was conducted in accordance with procedures presented in the Comprehensive RI/FS Work Plan (Hydrometrics 1987). Based on the results of the evaluation, the RI/FS concluded that the potential for impacts to groundwater and surface water from slag is low and the subsequent ROD did not specify any remedial action for the Slag Pile Operable Unit. Post-RI/FS monitoring at adjacent surface water and groundwater monitoring sites is on-going. A summary of the slag investigation and the findings of the RI relative to slag are presented below.

4.1.4.1 Investigation of Potential Groundwater Impacts

Slag Infiltration Test Basin Construction, Water Level Measurement, Water Quality Sampling and Analysis

Infiltration and percolation of precipitation into the slag pile were directly measured in slag test basins constructed in fumed and unfumed slag. Fumed slag is a by-product of the zinc

recovery process, which consisted of air injection into molten slag to recover zinc oxide. Unfumed slag is a by-product of the blast furnace which has not been further processed through the zinc recovery process. The zinc recovery process was suspended in 1982 and zinc is no longer recovered from the slag. Since 1982, unfumed slag has been placed in an area segregated from fumed slag.

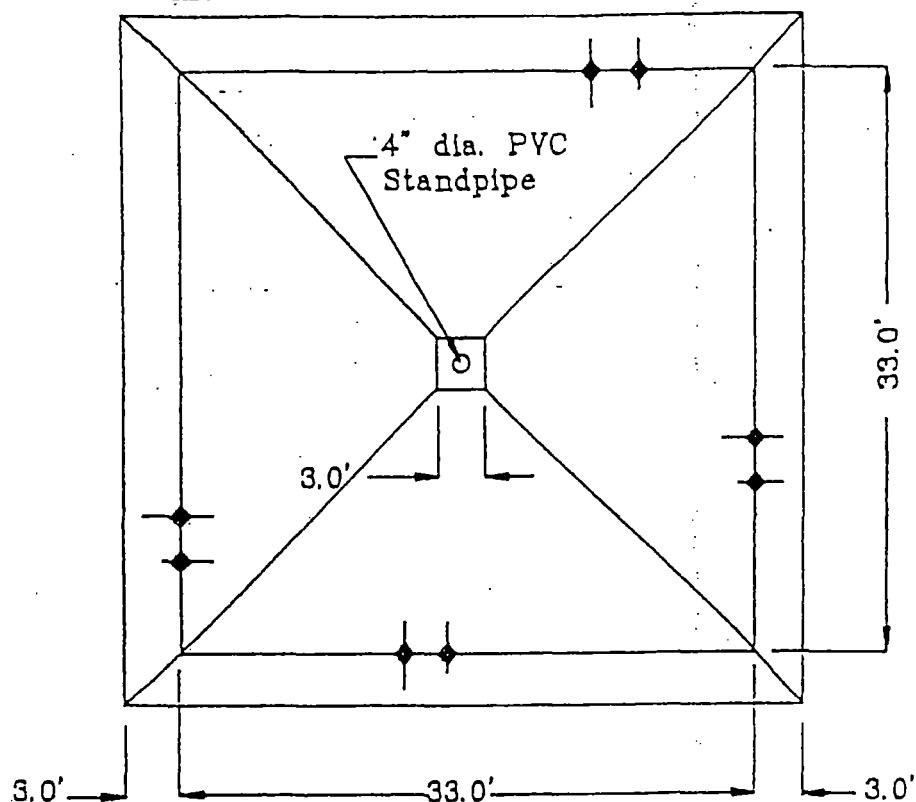
Two slag infiltration catchment basins were constructed; one in a typical location in the fumed slag, and one in a typical location in unfumed slag. Construction of the test basins included removal of a 2 to 3 meter layer of slag, placement of an impervious 36-mil reinforced Hypalon liner in the excavation, installation of a collection sump, and replacement of the slag. Figure 4-1-8 shows the slag test basin design.

Water elevations in the collection sumps were measured periodically, and after rainfall or snowmelt events to determine the actual accumulation of water in the slag basins. Collected water was pumped from the sump, sent to the TSC laboratory, and tested for the parameters listed in Table 3-2-2. Analytical results of water collected in the test basins are summarized in Appendix 4-1-2.

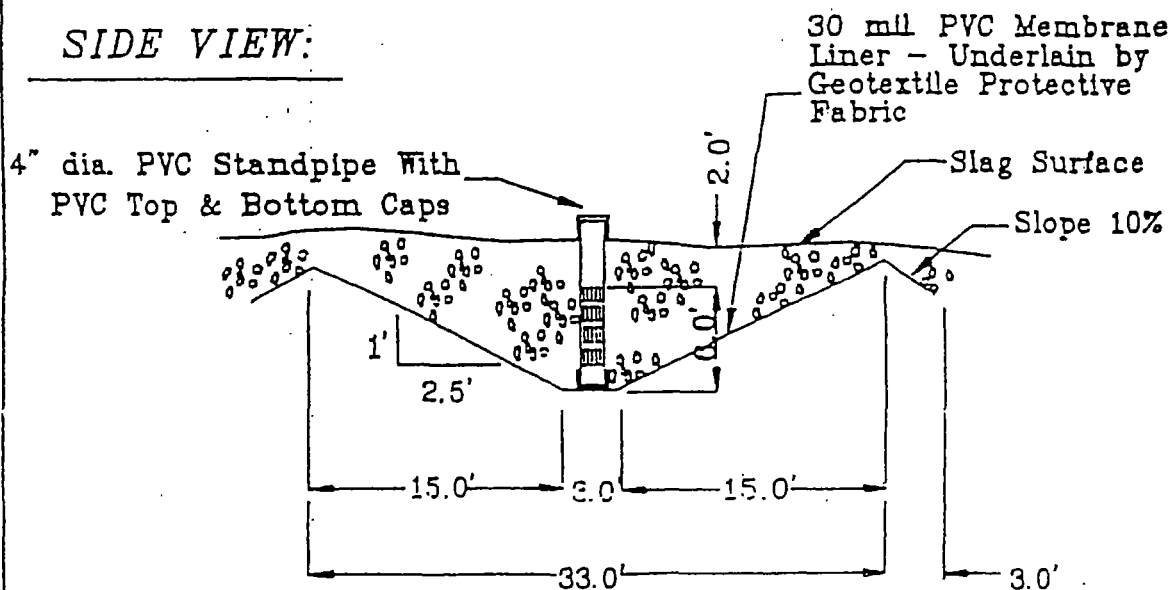
Slag Material Sampling and Analysis

To supplement slag information collected from the test basins, samples of slag were collected from the test basin sites and sent to the TSC lab for "bottle roll" tests. Estimates of slag leachability were obtained by conducting "bottle roll" test on slag samples. Bottle roll tests involved placing samples of slag in bottles in the laboratory, adding deionized water, agitating the bottles for approximately 24 hours, then analyzing the water for concentrations of arsenic and metals. Details of the bottle roll extraction tests are in the Quality Assurance Project Plan (QAPP) Addendum to the Phase II Water Resources Investigation Work Plan (Hydrometrics, 1986). Bottle roll test results are in Appendix 4-1-2.

PLAN VIEW:



SIDE VIEW:



NOTE: PVC Standpipe is schedule 40, capped on both ends and perforated with saw-cut slots from 2.0' to 8.0' beneath the slag surface.

In addition to the slag sampling and bottle roll test performed as part of the East Helena RI activities, additional slag samples were collected and analyzed using the EP toxicity procedure. Results of these analyses are also in Appendix 4-1-2.

Assessment of Groundwater Impacts

In an effort to estimate infiltration rates, the volume of water retained in the slag test basins was calculated for 13 time intervals, beginning December 23, 1986 and ending February 10, 1988. These volumes were compared to the volumes of precipitation during the same periods and converted to percentages, as summarized in Table 4-1-10. The percentage of precipitation retained in the basins varied from -6.7% to 61.9% in the fumed slag, and -45% to 61.8% in the unfumed slag (negative percentages indicate evaporation rates exceed precipitation collected in the test basins). Although there is a relationship of test basin water level fluctuations to precipitation (see Figures 4-1-9 and 4-1-10), the relationship may be complicated by variable evaporation, hence, infiltration rates are variable.

Concentrations of arsenic and metals from test basin water samples (see Appendix 4-1-2) were low compared to plant area groundwater. Dissolved arsenic varied from 0.0198 mg/l to 0.075 mg/l in the fumed slag, and 0.353 to 0.590 mg/l in the unfumed slag during the study period. Dissolved cadmium varied from 0.003 to 0.075 mg/l in the fumed slag, and 0.003 to 0.0063 mg/l in the unfumed slag. Dissolved lead varied from 0.016 to 0.045 mg/l in the fumed slag, and 0.021 to 0.098 mg/l in the unfumed slag.

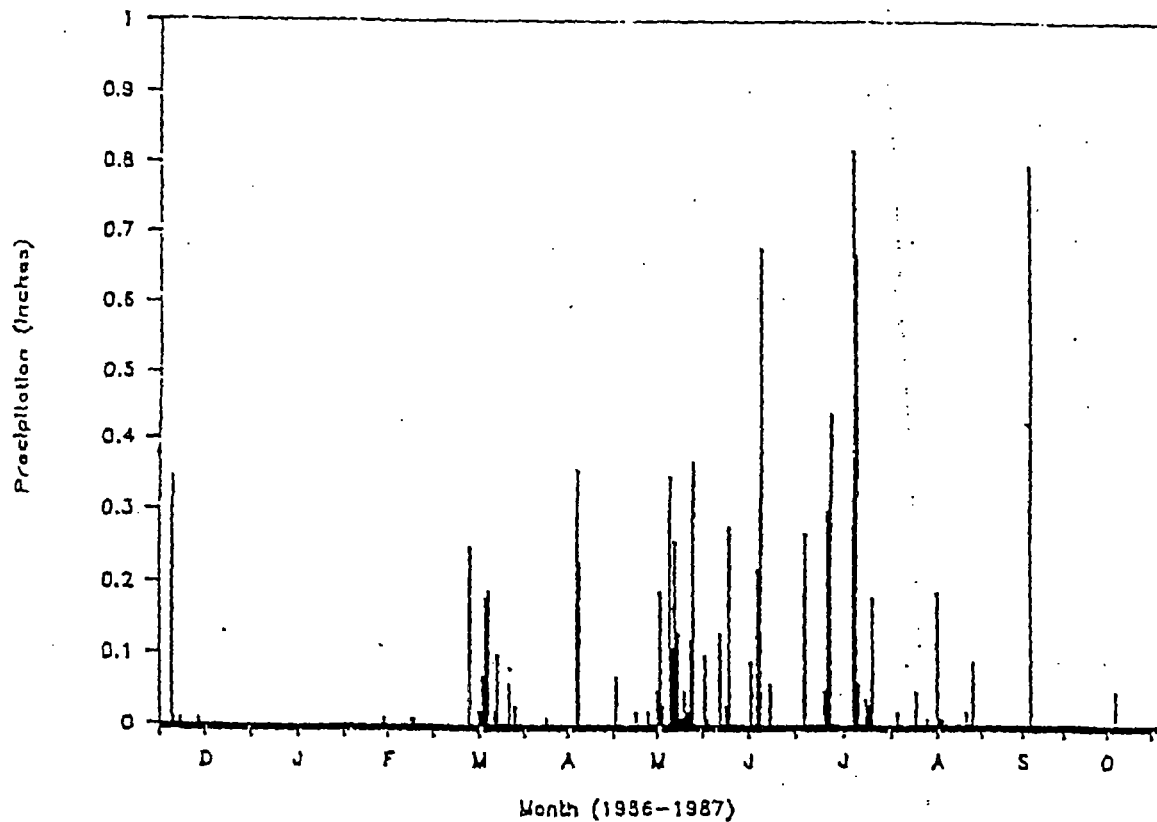
The concentrations of arsenic and metals from bottle roll testing (See Appendix 4-1-2) were similar to the slag test basin water quality. For the fumed slag, dissolved arsenic was 0.19 mg/l, cadmium was 0.003 mg/l, and lead was less than 0.017 mg/l. For the unfumed slag, dissolved arsenic was 0.31 mg/l, cadmium was 0.003 mg/l and lead was 0.083 mg/l.

EP toxicity tests (see Appendix 4-1-2) indicate that leachable trace element concentrations from the slag are variable. From 18 tests, the results for arsenic varied from below detection level to 1.2 ppm with an average of 0.16 ppm; cadmium varied from below detection level to

TABLE 4-1-10. PRECIPITATION COLLECTED IN SLAG TEST BASINS

FUMED SLAG			
Date	Precipitation (inches)	Precipitation Retained * (Inches)	Percent of Precipitation Retained
12/23/86			
1/22/86	0		
2/23/87	0		
3/26/87	0.75	0.01	1.4
4/21/87	0.23	-0.01	-5.8
5/18/87	0.51	0.32	61.9
6/18/87	2.46	0.49	19.8
7/14/87	0.88	0.25	28.7
8/11/87	1.70	0.36	21.2
9/11/87	0.37	not calculated	
10/14/87	0.65	0.25	38.4
12/7/87	0.45	-0.02	-3.9
1/20/88	0.34	-0.02	-6.7
2/10/88	0.49	-0.01	-1.1
UNFUMED SLAG			
12/23/86			
1/22/87	0		
2/23/87	0		
3/26/87	0.75	0	
4/21/87	0.23	0.12	52.7
5/18/87	0.51	0.27	53.6
6/18/87	2.46	0.73	29.8
7/14/87	0.88	0.28	31.7
8/11/87	1.70	0.12	7.2
9/11/87	0.37	not calculated	
10/14/87	0.65	0.40	61.8
12/7/87	0.45	-0.05	-12.1
1/20/88	0.34	-0.15	-45.0
2/10/88	0.49	0.14	27.6

* Value is calculated based on measured water level changes and test basin geometry (Frustum of a general pyramid). Negative values indicate evaporation exceeds infiltration.

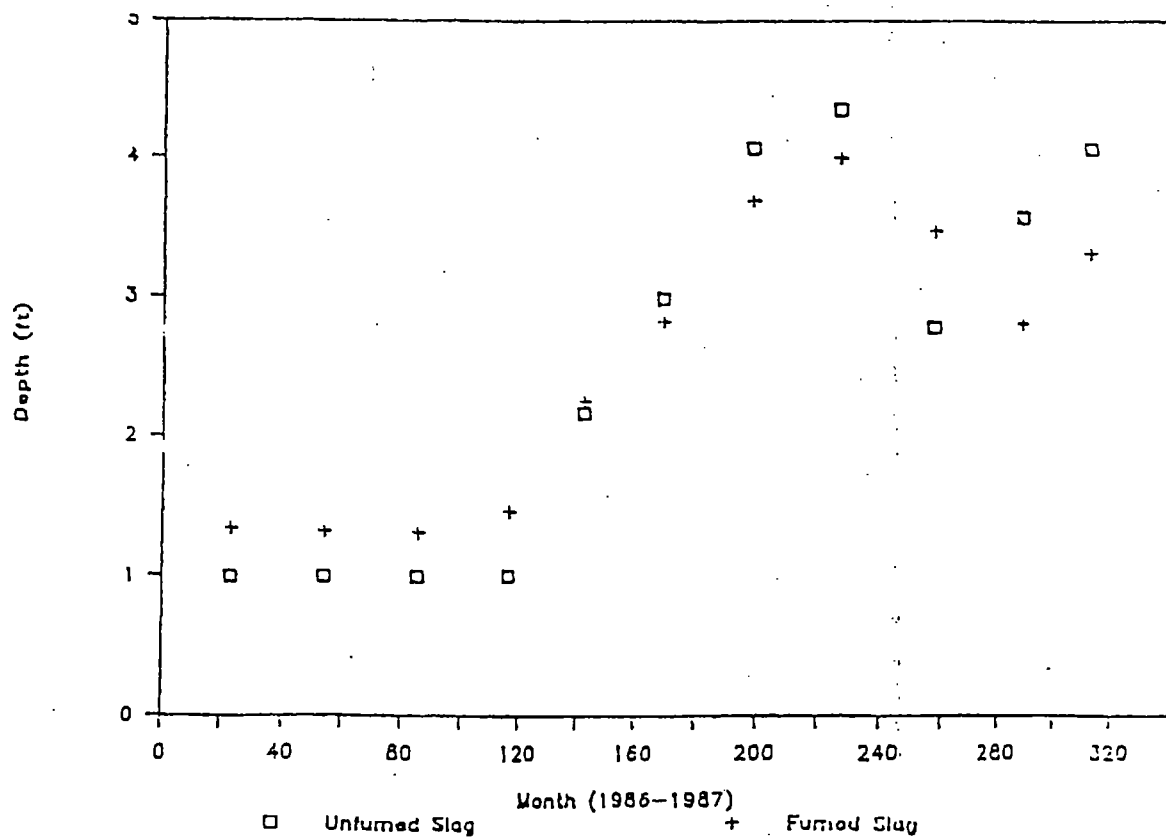


CC/RA REPORT
ASARCO EAST HELENA
FACILITY

DAILY PRECIPITATION
AT HELENA AIRPORT

FIGURE

4-1-9



CC/RA REPORT
ASARCO EAST HELENA
FACILITY

DEPTH OF WATER IN
SLAG TEST BASIN

FIGURE

4-1-10

3.9 ppm, with an average of 0.26 ppm (only one cadmium value was greater than 0.25 ppm; if the 3.9 ppm value is dropped, the cadmium average concentration is 0.04 ppm); lead values varied from below detection level to 30 ppm, with an average of 5.2 ppm.

The EP Toxicity tests were not conducted as part of the Comprehensive RI/FS activities, but have been included as supplementary data. The EP Toxicity results tend to overpredict the mobility of metals compared to the other test results and observed site conditions due to the low pH of the extractant. In particular, the values for lead appear to be much higher with TCLP than with natural conditions.

Concentrations of arsenic and other metals in the groundwater system are discussed in detail in Section 4.4. In general, results of water quality from the slag basins and bottle roll analyses of slag indicate arsenic concentrations are significantly lower than concentrations observed in monitoring wells both upgradient and downgradient of the slag pile. Figures 4-1-11, 4-1-12, 4-1-13 and 4-1-14 show a comparison to slag test basin water quality, bottle roll test water quality, EP Tox test results, and groundwater quality upgradient and down gradient of the slag pile.

Based on observed recharge rates in the slag test basins and associated water quality data, the slag pile would account for only 1 to 3 percent of the observed arsenic at downgradient monitoring well DH-10 (see Figure 4-1-15). Concentrations of arsenic in these wells are similar to arsenic concentrations in DH-4 near Lower Lake, the apparent source of elevated arsenic in these wells. Based on the results of test basin water quality analyses and bottle roll tests, it is unlikely that slag significantly effects observed arsenic concentration trends on the site.

While EP-Toxicity results indicate that there is some potential for mobility of cadmium, lead and zinc from slag, the results of the test basins and bottle roll tests indicate metals concentrations released from slag is low. In addition, concentrations of cadmium, lead and

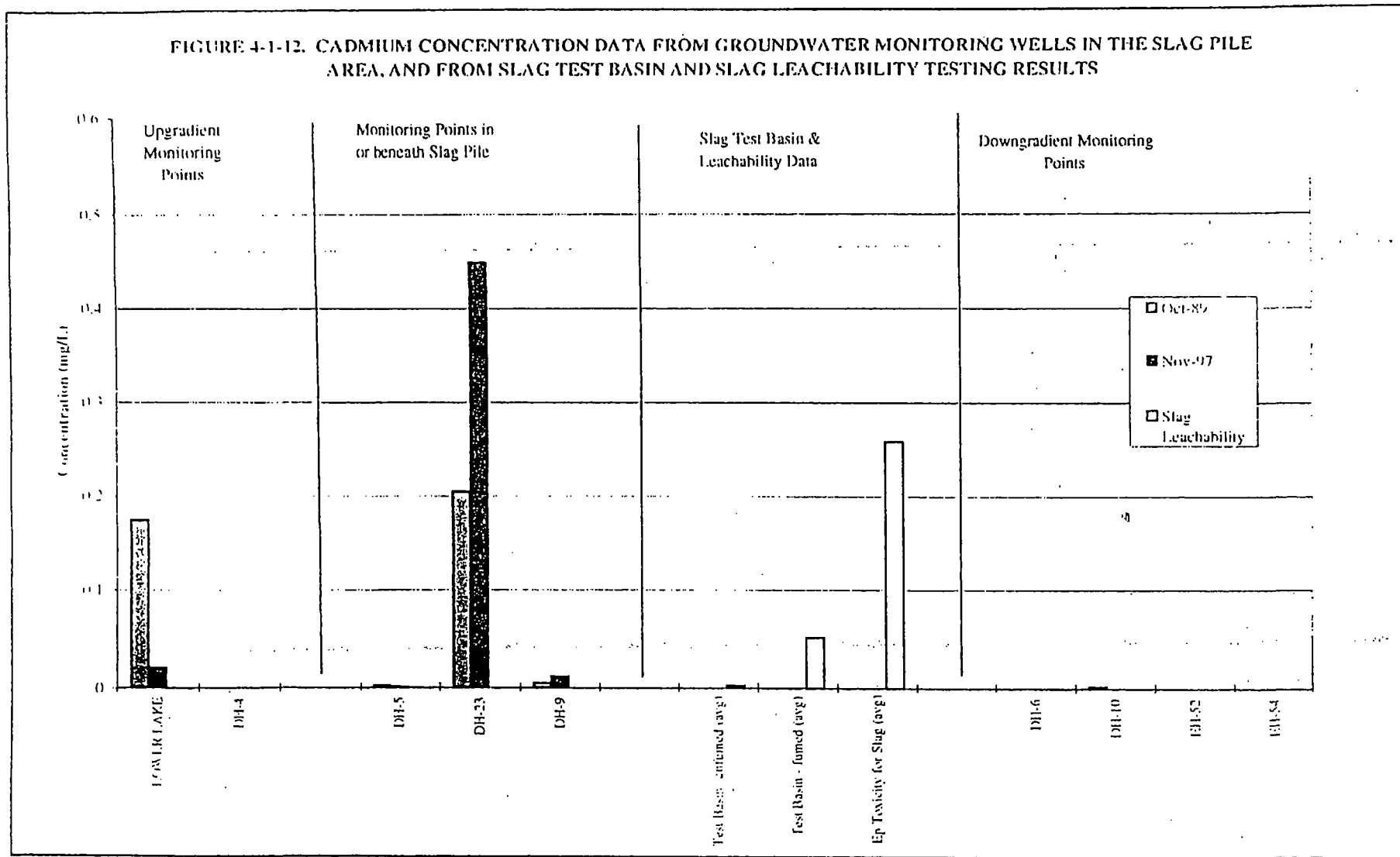
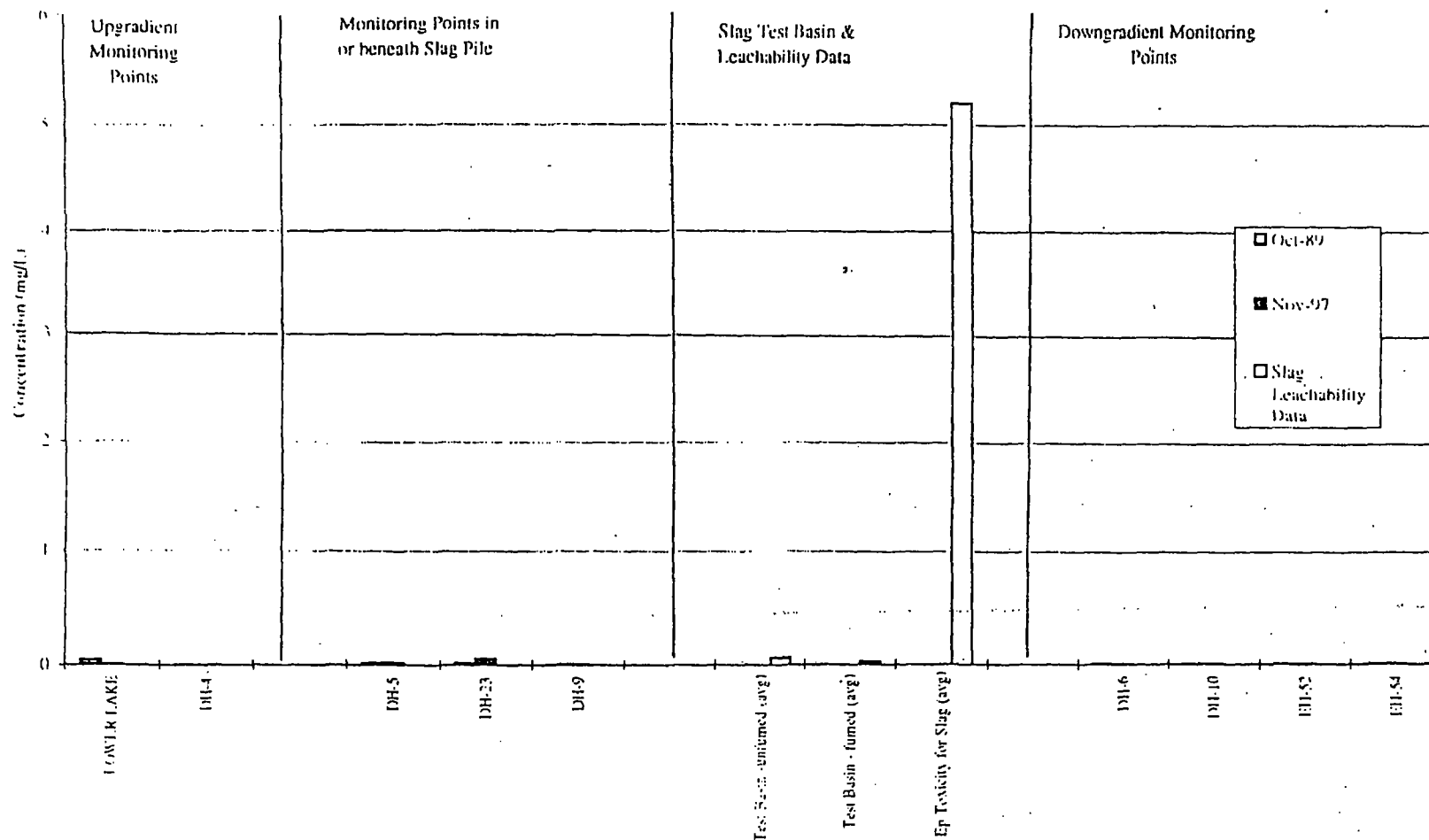
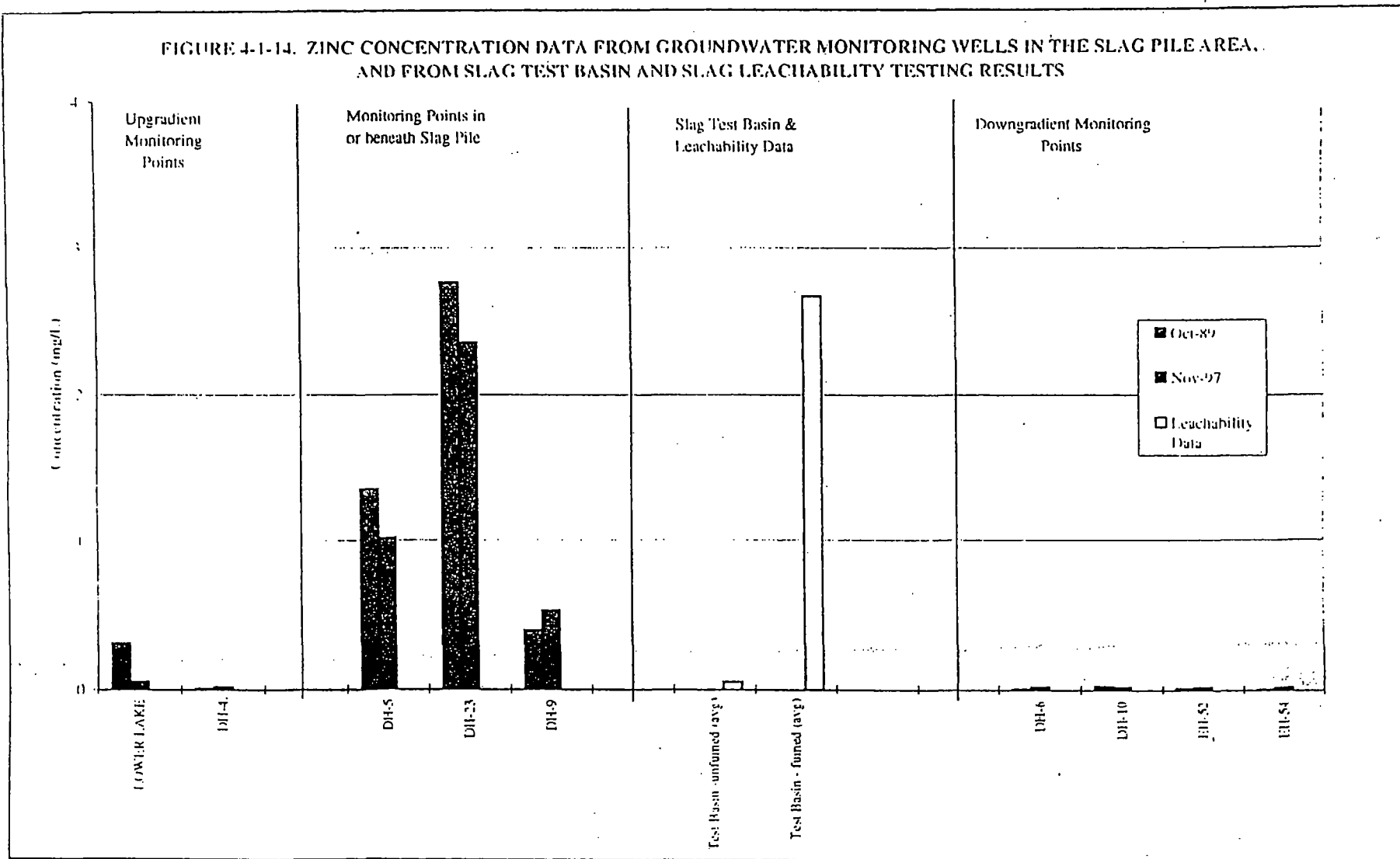


FIGURE 4-1-13. LEAD CONCENTRATION DATA FROM GROUNDWATER MONITORING WELLS IN THE SLAG PILE AREA, AND FROM SLAG TEST BASIN AND SLAG LEACHABILITY TESTING RESULTS





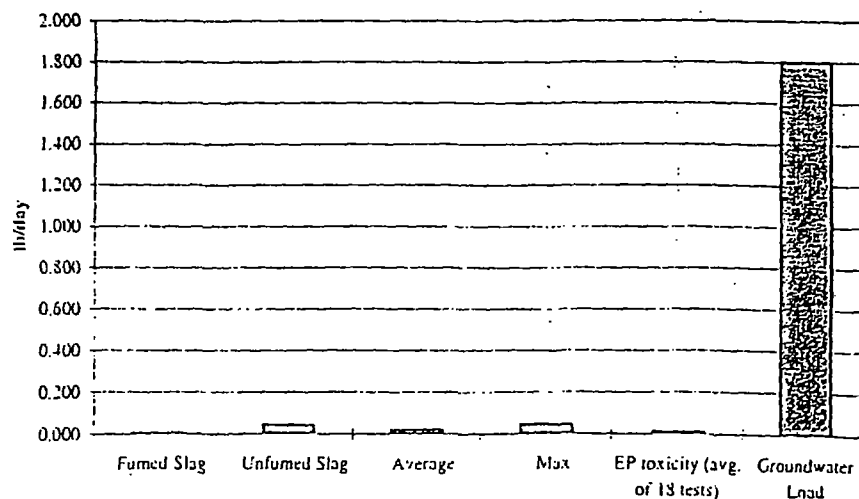
**FIGURE 4-1-15. CALCULATED ARSENIC LOADING FROM SLAG VS
ARSENIC LOAD IN DOWN-GRADIENT GROUNDWATER**

Data Source	Arsenic Conc.(1)	Arsenic Load (2)	% of GW Load (3)
Test Basin Data			
Fumed Slag	0.036 mg/L	0.003 lb/day	0.20%
Unfumed Slag	0.53 mg/L	0.044 lb/day	2.40%
Average	0.28 mg/L	0.022 lb/day	1.30%
Max	0.59 mg/L	0.047 lb/day	2.60%
EP toxicity (avg. of 18 tests)	0.16 mg/L	0.013 lb/day	0.70%
Groundwater Load	2.13 mg/L (4)	1.8 lb/day (4)	

- Notes**
- (1) Source RI/FS Appendix 6-1
 - (2) Slag load calculations assume:
20% infiltration (slag test basin average)
11.3 in/yr ppt
57 acre slag pile area
 - (3) Calculations based on 1.8 lb/day GW arsenic load assuming:
east side groundwater flux of 70 gpm
east side groundwater arsenic concentration of 2.13 mg/L
 - (4) Groundwater Load assumptions
Groundwater As Concentration 2.13 mg/L (avg from DH-10)
Groundwater flux = 70 gpm

(K:\DATA\PROJECT\0867\WQ.XLS)

Arsenic Load



zinc is also very low. Based on the results of test basin water quality analyses, bottle roll tests, and down gradient groundwater quality, it is unlikely that slag effects observed groundwater quality trends on the site.

Stratigraphic cross-sections showing the slag pile and underlying stratigraphy (Figure 4-1-16) shows the relationship of the slag pile and underlying strata, including the perched alluvial horizon and the underlying coarser grained alluvial aquifer. Based on monitoring well stratigraphy, it is likely the perched horizon at least partially underlies the slag pile. However, there is no evidence of the perched horizon in downgradient wells (see DH-6 and DH-10). As a result, direct impacts from the slag pile at these wells is unlikely since the perched horizon is absent, and the wells are completed in the coarse grained alluvium. However, as noted above, test basin and laboratory test results indicate potential water quality impacts from the slag are low and are not responsible for the water quality concentration observed in downgradient wells.

4.1.4.2 Potential Surface Water Impacts

The potential for runoff transport in the slag pile area is very low due to the coarse, granular nature of the slag pile, which allows extremely rapid infiltration. Even during high precipitation events no runoff has been observed from the slag pile. Similarly seeps from the face of the slag pile have not been observed. The potential for impacts to surface water are, therefore, limited to direct contact and erosion of the slag pile where it forms steep sided banks adjacent to Prickly Pear Creek. Prickly Pear Creek is in immediate contact with the slag pile between PPC-5 and PPC-6, and adjacent to the slag pile from PPC-6 to PPC-7 (see Exhibit 3-2-1).

The 1990 Comprehensive RI/FS (Hydrometrics, 1990a) examined water quality data from Prickly Pear Creek to assess the potential impact of the slag pile on the creek. No consistent concentration or load increases were apparent in Prickly Pear Creek adjacent to the slag pile (between PPC-5 and PPC-7). The RI/FS therefore concluded that the contribution of arsenic and metals to surface water from slag is very minor. RI/FS and Post RI/FS water quality data

for Prickly Pear Creek are presented and discussed in Section 4.3 of this report and post-RI/FS water quality data are generally consistent with the RI/FS findings. Average metal concentrations show only small differences between stations PPC 5, PPC 7 and PPC 8 (see Figure 4-1-17). Only one high flow stream event (May 1994) shows a pronounced increase in total arsenic load between PPC-5 and PPC-7 (see Figure 4-3-9 in Section 4.3); however, arsenic concentrations decreased from PPC-5 to PPC-7 in the May 1994 event. The calculated load increase is therefore entirely a function of the flow measurement. Since the accuracy of the flow measurements is poor during higher flow events due to increased velocities and turbulence (particularly at PPC-5 below the dam) the apparent load increase during May 1994 is probably the result of flow measurement error. The conclusion of the surface water analysis is that there is little evidence for transport of arsenic and metals from the slag pile with the possible exception being direct erosion of the slag during infrequent high stream flow events.

1.14.2 PROCESS FLUIDS

As part of the Comprehensive RI/FS (Hydrometrics 1990a), the Process Fluids Operable Unit was divided into two sub-units: Process Ponds and Process Fluid Transport Circuits.

1.14.2.1 Process Ponds

The Process Ponds include:

- Lower Lake;
- Former Thornock Lake, and
- The acid plant water treatment facility.

As described in Sections 1 and 3, the Process Ponds were addressed by the Process Ponds RI/FS (Hydrometrics, 1989), a subsequent Process Ponds ROD (US EPA, 1989), and several RD/RA documents, and remedial actions that consisted primarily of sediment excavation. The 1989 Process Pond RI consisted of:

ASARCO TECHNICAL SERVICES CENTER

ANALYTICAL DATA REPORT

East Helena

Technical Services (Project 3101)

Batch No: L010790

LAB NO	DATE COLLECTED	DESCRIPTION	PARAMETER	VALUE	UNITS	ANALYST	DATE ANALYZED	HOLD DAYS	METHOD
L010790-002	23-MAY-01	FUMED ASARCO SIAC	AG	0.003	μ	MJF	19-JUN-01		ICP
			AL	2.32	μ	MJF	18-JUN-01		ICP
			AS	0.022	μ	MJF	19-JUN-01		ICP
			BA	0.34	μ	MJF	18-JUN-01		ICP
			BE	<0.02	μ	MJF	18-JUN-01		ICP
			CR	0.036	μ	MJF	18-JUN-01		ICP
			CU	0.32	μ	MJF	18-JUN-01		ICP
			HG	2.7	ppm	MO	21-JUN-01		COLD VAPOR AA
			MN	1.37	μ	MJF	18-JUN-01		ICP
			HI	<0.02	μ	MJF	18-JUN-01		ICP
			PD	0.036	μ	MJF	19-JUN-01		ICP
			SD	0.026	μ	MJF	18-JUN-01		ICP
			SE	<0.02	μ	MJF	18-JUN-01		ICP
			TL	<0.02	μ	MJF	18-JUN-01		ICP
			V	<0.02	μ	MJF	18-JUN-01		ICP
			Zn	1.63	μ	MJF	18-JUN-01		ICP

ASARCO TECHNICAL SERVICES CENTER

ANALYTICAL DATA REPORT

East Helena

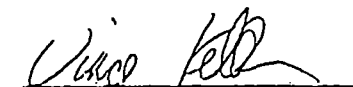
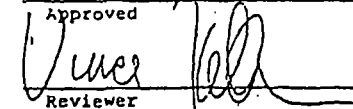
Technical Services (Project 3101)

Batch No: L010791

LAB NO	DATE COLLECTED	DESCRIPTION	PARAMETER	VALUE	UNITS	ANALYST	DATE ANALYZED	HOLD DAYS	METHOD
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L010791-002 23-MAY-01 FUMED ASARCO SLAG (TCLP)

AC	<0.050	ppm	ESH	08-JUN-01	6010
AS	<0.10	ppm	ESH	08-JUN-01	6010
BA	1.4	ppm	ESH	08-JUN-01	6010
BE	<0.005	ppm	ESH	08-JUN-01	6010
CD	<0.050	ppm	ESH	08-JUN-01	6010
CR	<0.10	ppm	ESH	08-JUN-01	6010
HG	<0.50	ppb	MO	07-JUN-01	7470
NI	<0.10	ppm	ESH	08-JUN-01	6010
PB	0.23	ppm	ESH	08-JUN-01	6010
PH	9.2	pH	MO	05-JUN-01	150.1
SE	<0.10	ppm	ESH	08-JUN-01	6010
TL	<0.10	ppm	ESH	08-JUN-01	6010
V	<0.10	ppm	ESH	08-JUN-01	6010
ZN	17	ppm	ESH	08-JUN-01	6010


 Approved

 Reviewer

APPENDIX E

TEMPORARY CAP SPECIFICATIONS AND DETAILS

INSTALLATION SPECIFICATION —RPE® GEOMEMBRANE

PART 1 – GENERAL

1.1 SCOPE

- A. The work covered by this specification consists of the supply (and installation) of an RPE geomembrane at the locations shown on the drawings (as directed by the Owner).
- B. The supply (and installation) of this liner shall be in accordance with the following references:
 - 1. ASTM D751-89, Standard Test Methods for Coated Fabrics.
 - 2. ASTM D3020-89, Standard Specification for Polyethylene and Ethylene Copolymer Plastic Sheeting for Pond, Canal, and Reservoir Lining.
 - 3. ASTM D4545-86(91), Standard Practice for Determining the Integrity of Factory Seams Used in Joining Manufactured Flexible Sheet Geomembranes.

PART 2 – PRODUCTS

2.1 MATERIAL CHARACTERISTICS

- A. The sheeting shall be suitably formulated from first quality polyethylene materials. The geomembrane shall consist of a high strength, oriented-tape HDPE scrim coated on both sides with an impervious LDPE coating (HDPE coating for OR RPE 25). RPE materials prepared for temporary covers or other exposed application will have UV stabilizers added to the impervious coating (and may have UV stabilizers added to the scrim tapes). The RPE material shall be pigmented to produce a uniform color such as black, blue, or silver. Unpigmented materials may be used for applications that are backfilled.
- B. The sheeting shall be capable of being sealed to itself using a stitched “Z” fold or heat-sealing techniques.
- C. The sheeting shall be supplied in the widest widths possible to minimize fabrication seaming. Roll widths shall be not less than 3.5 m.

2.2 MANUFACTURER’S STATEMENT

- A. Upon request, the manufacturer of the RPE sheeting shall submit a certification that the material meets the manufacturer’s specifications. Material index quality control tests shall be performed a minimum of every 18,000 kg (40,000 lbs), once per shift, or at the start of a new material run.

2.3 MATERIAL PROPERTIES

- A. The geomembrane shall be OR RPE 25 as supplied by Layfield Plastics or an approved equal. The geomembrane shall conform to the manufacturer’s material properties table. All values are Typical Values unless otherwise noted.

2.4 WARRANTY

- A. Contractor shall provide Owner with a warranty guaranteeing a minimum of three year satisfactory liner performance from defects and UV-degradation.

PART 3 – EXECUTION

3.1 FABRICATION

- A. On all projects larger than 20,000 m² (200,000 ft²), submit a panel layout in accordance with the project submittal requirements. On the panel layout, indicate the proposed arrangement of panels, fabricated seam orientation, field seam location, and anchor trench locations.
- B. Individual roll widths of RPE shall be fabricated into large panels to minimize field seaming. All fabrication welds shall be a minimum of 25 mm (1 inch) wide. Heat welding techniques shall be used for shop fabrication such that all shop welds will provide a delamination of the coating from the scrim when tested. Peel testing will meet the requirements for a "Film Tear Bond" (FTB) Peel Adhesion. The minimum FTB rating shall be AD-DEL.
- C. Fabrication welding shall be tested for Bonded Seam strength at a rate of three samples for every 915 lineal meters (3,000 ft) of welded seam. At the fabricator's option, one sample may be taken from each 300 lineal meters (1,000 ft) of welded seam or every 5 shop seams (whichever is greater). Seam samples will be tested for shear strength. Fabricated seam strengths shall conform to the shop seam strength values. Seams samples shall also be qualitatively tested for peel adhesion with a Film Tear Bond rating being obtained on all seams. Seams that do not meet the strength or FTB criteria are to be repaired and retested.
- D. Fabricated panels shall be accordion folded in one direction and neatly rolled in the other. Each panel shall be protected with an opaque, weather resistant covering and marked with panel dimensions and unfolding directions. All panels shall be delivered and stored in a protected area until ready for installation.

3.2 INSTALLATION

- A. Prepared surfaces shall be smooth and free of sharp objects, rocks, and organics (roots). If a suitable subgrade is not available then 100 mm (4 inches) of clean sand, and a 10 ounce geotextile shall be placed prior to liner installation (subject to site conditions). A 10 ounce geotextile shall be placed under the liner in all areas.
- B. Installation shall be performed in a logical sequence by an installer/contractor experienced in lining installations.
- C. Place panels according to the drawings and the panel layout. Sufficient thermal slack shall be incorporated during placement to ensure that harmful stresses do not occur in service. Distribute slack wrinkles evenly.
- D. All field seams shall be tightly bonded using tape seaming technology. Six inch wide polyisobutylene-butyl sealant tape shall be used at penetrations and for all field seams.
- E. Full contact between the tape and the material will be the standard of acceptance.
- F. All field seams shall be non-destructively tested along their entire length using the Air Lance Test (ASTM D4545) or the Mechanical Point Stress Test (ASTM D4545). Patches and seams around pipe penetrations and fitments shall be tested using the Point Stress Test (ASTM D4545). All discontinuities detected by any test method shall be repaired.
- G. Repairs shall utilize the same material as the geomembrane, or a material compatible with the geomembrane, and shall extend a minimum of 300 mm (12 inches) beyond the defect. Repairs shall be accomplished with tape seaming techniques utilizing a tape appropriate to existing site conditions. All repairs are to be tested using Air Lance or Mechanical Point Stress methods as applicable (ASTM D4545).

- H. Protect the geomembrane from wind uplift during installation through the use of sand bags or other suitable weights. Backfill anchor trenches and place design backfill on geomembrane as soon as practical. Placement of backfill should be monitored continuously, and any damaged areas repaired and tested.
- I. Shingle RPE seams in the direction of water flow as applicable. If possible, backfill in the direction of flow to prevent application of stresses to field seams.
- J. Pipe Boots. Fit and seal pipes, well casings, manholes, and other penetrations of the geomembrane with shop fabricated boots as shown on the Drawings. Match the flange portion of the boot to the angle of the slope or bottom where the pipe or manhole enters the liner for a smooth fit without excess stretching of the material.

END OF SECTION

CLARIFICATIONS FOR TEMPORARY CAP DESIGN

Clarification #1 - RPE® Geomembrane

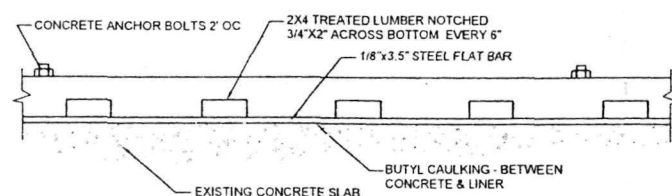
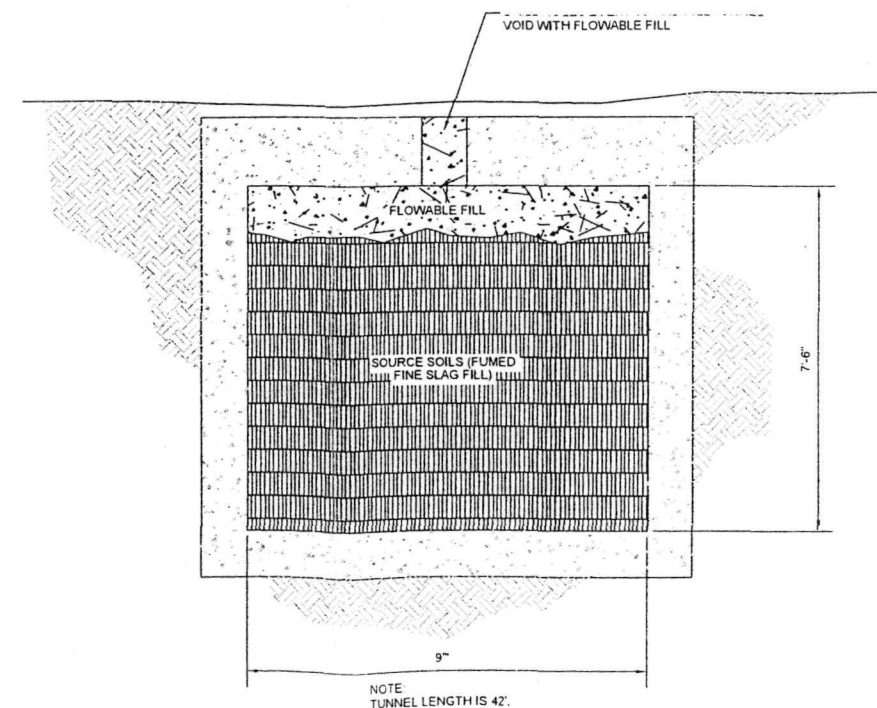
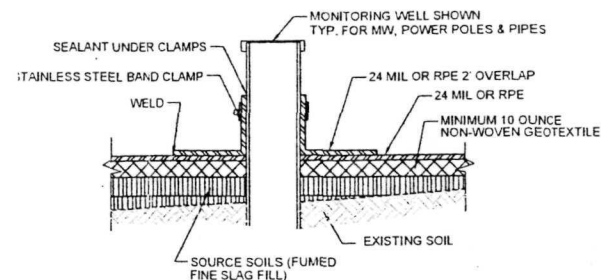
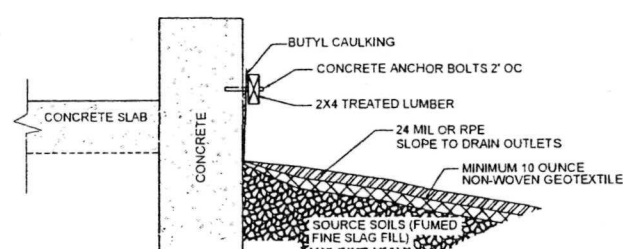
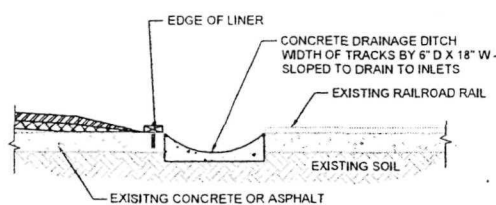
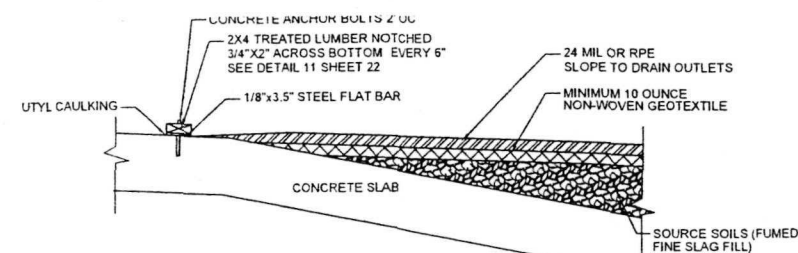
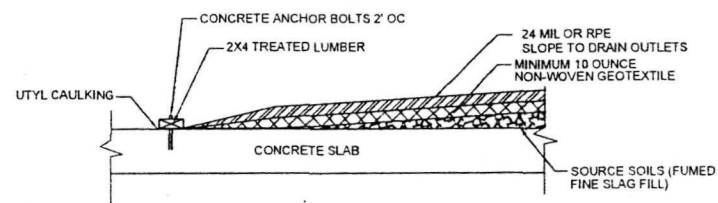
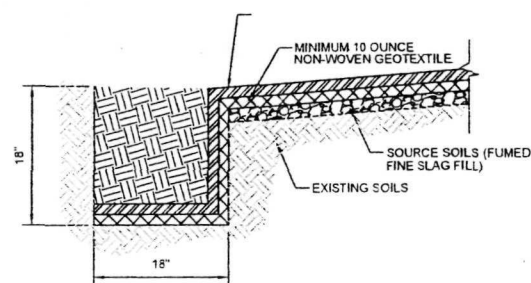
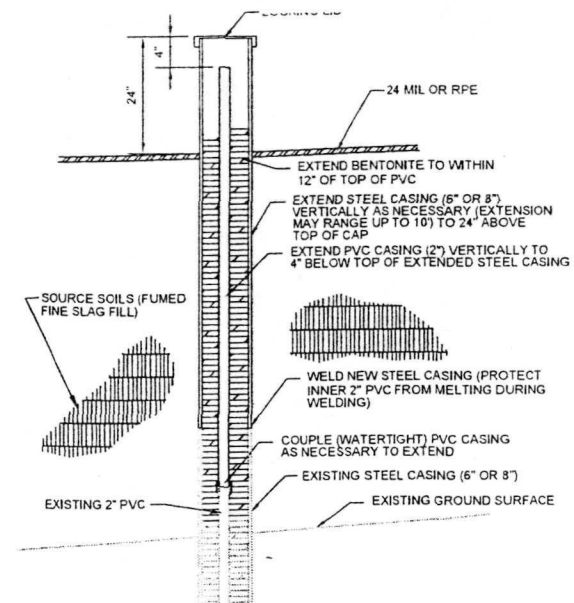
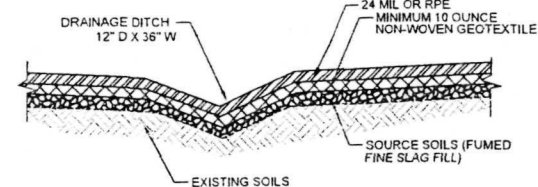
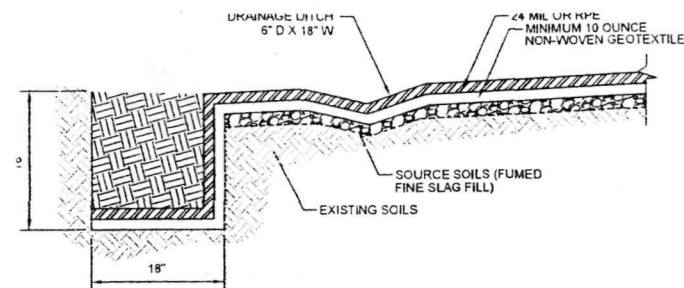
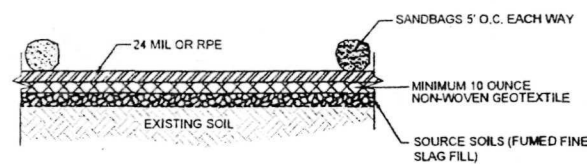
The clarification for the conflict between Note 4 on Hydrometrics Sheet 16 and the Installation Specification —RPE® Geomembrane of this Appendix C regarding the seaming requirements is that seams shall be sewn. Note 4 on Sheet 16 states that the seams must be sewn. The Installation Specification – RPE Geomembrane states that the seams can be either sewn or taped. This clarification states that for the construction of the Temporary Cap at the former Speiss-Dross Plant area, the RPE geomembrane seams shall be sewn and taping will not be allowed.

Clarification #2 – Clean Sand Substitute


Slag may be substituted for clean sand for subgrade preparation as specific in the Installation Specification —RPE® Geomembrane, Paragraph 3.2 (A).

Clarification #3 – Final Grade Flow Pattern

The importance of the final grade flow pattern will be discussed in further detail at the pre-bid conference.



NO	BY	DATE	DESCRIPTION	NO	BY	DATE
1	JSD	022607	REVISION TO DETAIL 7 FOR CLARITY, DETAIL 8 TEXT EDIT IN TITLE			

SCALE VERIFICATION
BAR IS ONE INCH ON
ORIGINAL DRAWING
0  1
IF NOT ONE INCH ON
THIS SHEET, ADJUST
SCALES ACCORDINGLY

Project No.	6052
DRAWN BY	
CHECKED BY	
APPROVED BY	
SCALE	AS NOTED

Hydrometrics, Inc.
Consulting Scientists and Engineers
Helena, Montana 59601
3020 Bozeman Avenue
(408) 443-4150

ASARCO LLC - EAST HELENA PLANT
2007 CLEANING & DEMOLITION PROJECT
DETAILS

DRAWING FILE NUMBER	
605202H022.dwg	
AUTOCAD 2004 DRAWING (DWG)	
SHEET NUMBER	REV
22	1

APPENDIX F

EXAMPLE INSPECTION FORM

INTERIM CAP INSPECTION CHECKLIST

AREA INSPECTED	Area No.		Inspected by:	DATE:		
	ITEM NO.	CONDITION	OBSERVATION	ACTION NEEDED		
				MONITOR	INVESTIGATE	REPAIR
INTERIM LINER SYSTEMS	1	Exposed liner				
	2	Sand Bags				
	3	Liner Seams				
	4	Liner/Concrete Attachments				
	5	Site Drainage				
Additional Comments:						